

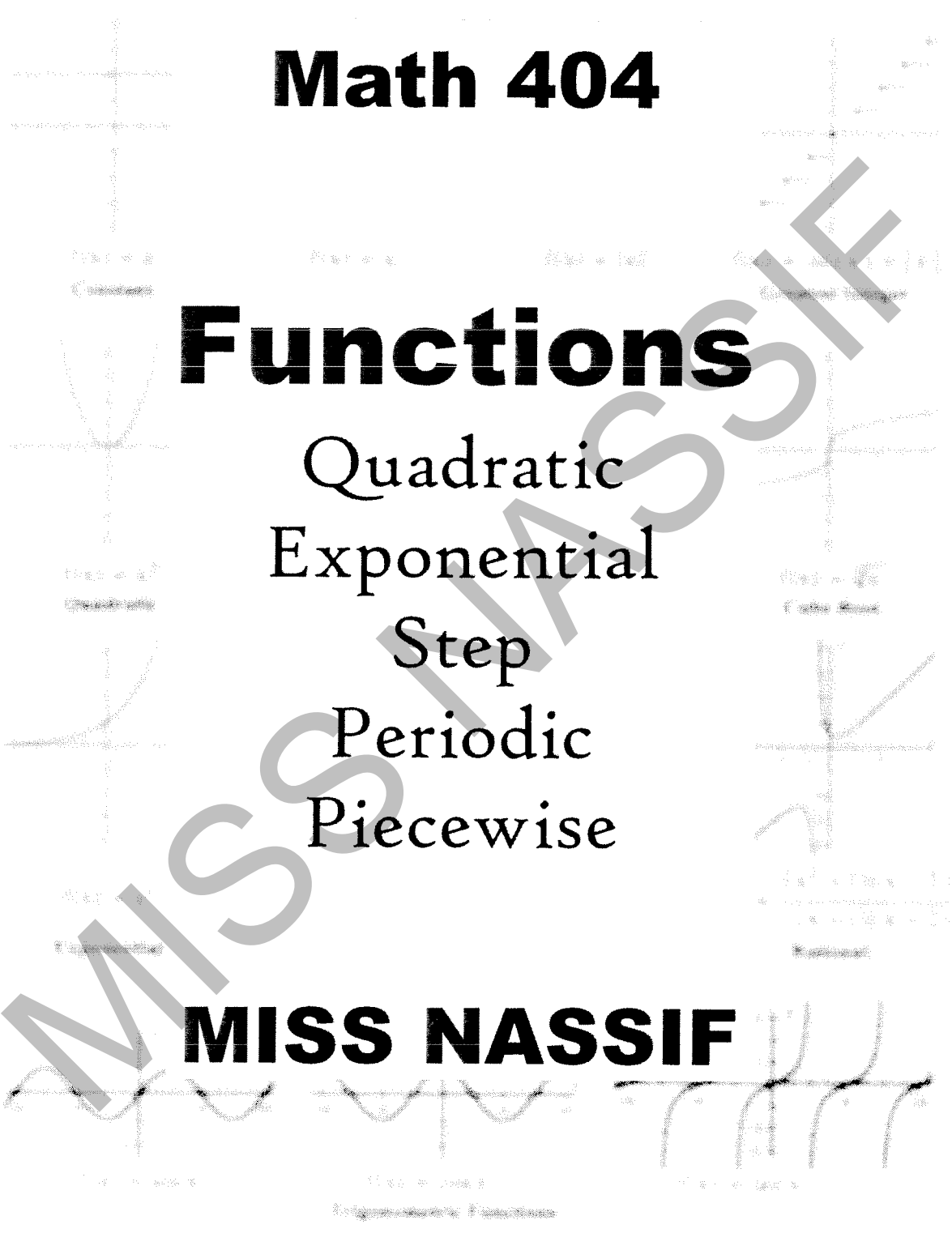
PARENT FUNCTIONS

Math 404

Functions

Quadratic
Exponential
Step
Periodic
Piecewise

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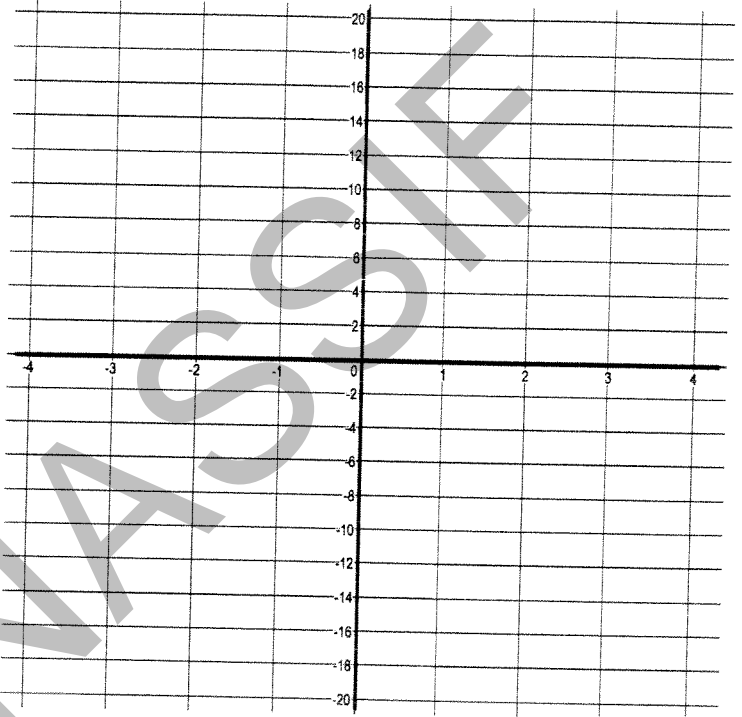
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Quadratics

1. Create a **table of values** for the following quadratic functions, then **graph** them.

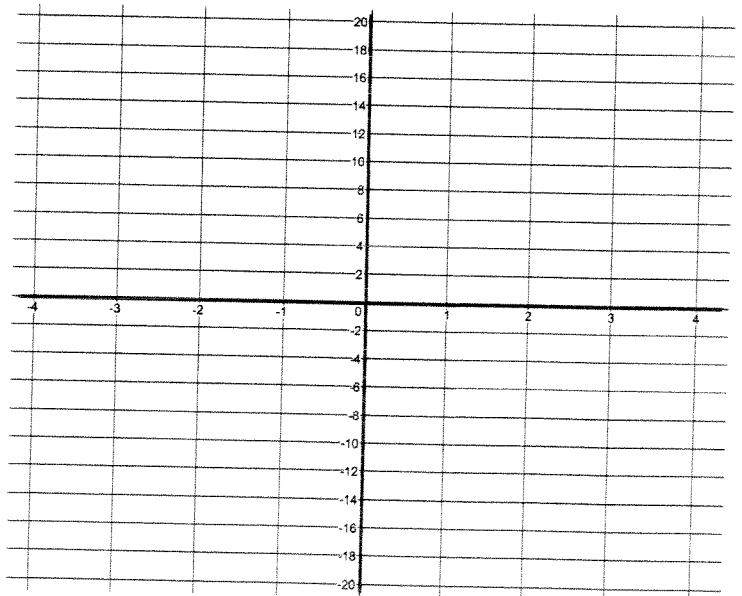
a. $y = x^2$

X	-4	-2	-1	0	1	2	4
Y							



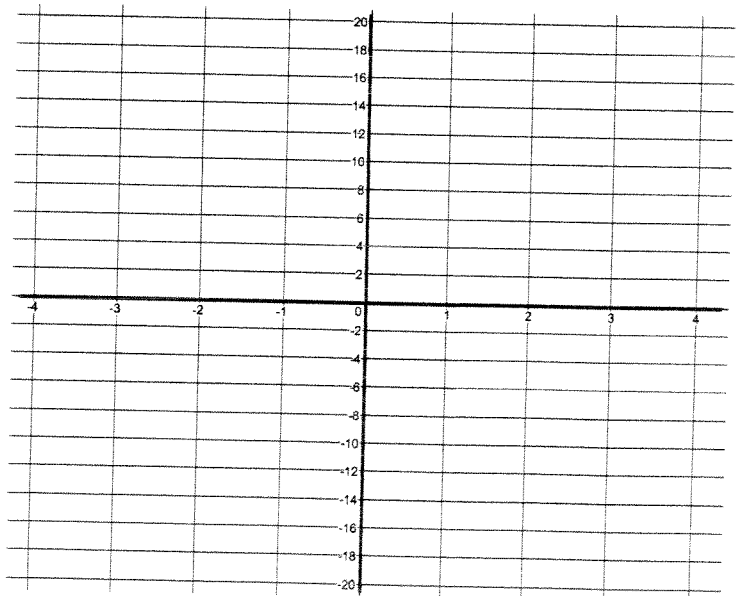
b. $y = 2x^2$

X	-3	-2	-1	0	1	2	3
Y							



c. $y = -2x^2$

X	-3	-2	-1	0	1	2	3
Y							



d. $y = 0.25x^2$

X	-4	-2	-1	0	1	2	4
Y							

Functions - Quadratics

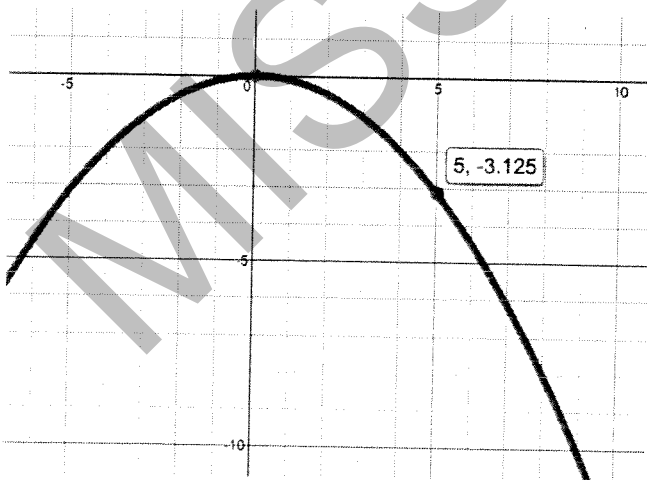
1. $f(x) = -0.5x^2$, if $f(x) = -112.5$, what is the value of 'x'?

Answer: _____

2. $f(x) = ax^2$, If the function passes through $(-12, -115.2)$, what is the value of 'a'?

Answer: _____

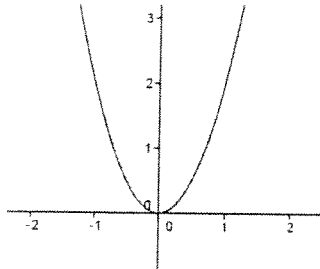
3. What is the rule for the following function?



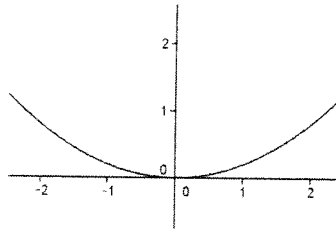
Answer: _____

4. Consider the following function $f(x) = 2x^2$
 Which of the following graphs represents the function?

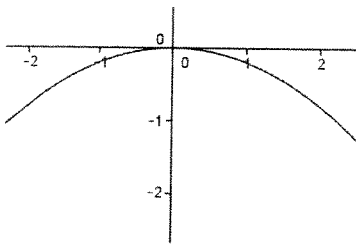
A)



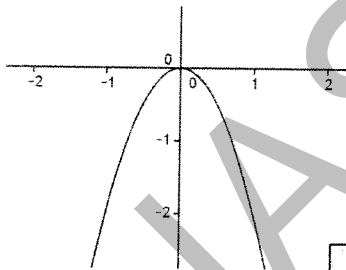
B)



C)

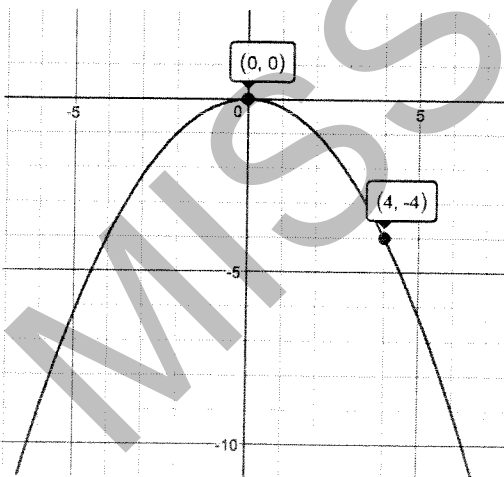


D)



Answer: _____

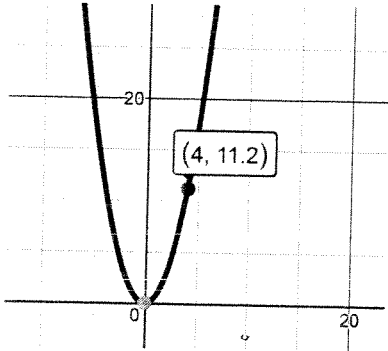
5. What is the rule for the following function?



Answer: _____

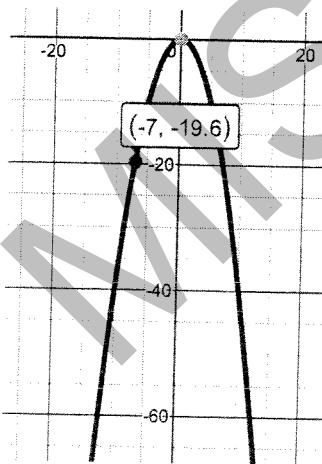
Function - Quadratics

1. A second degree function $f(x) = ax^2$ runs through point $(4, 11.2)$.
If the **same function** passes through $x = -5$, what is the value of 'y'
Round your answer to the nearest **tenth** of a unit (**1 decimal place**)



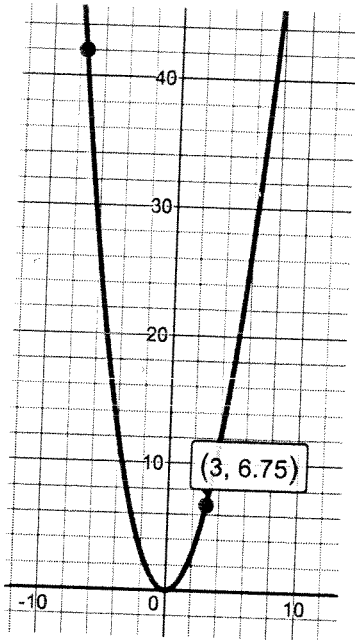
Answer: (-5 , _____)

2. A second degree function $f(x) = ax^2$ runs through point $(-7, -19.6)$.
If the **same function** passes through $y = -60$, what is the value of 'x'
Round your answer to the nearest **tenth** of a unit (**1 decimal place**)



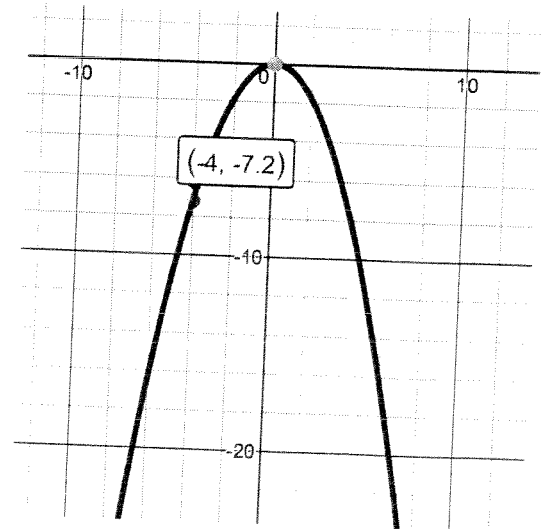
Answer: (_____ , -60)

3. A second degree function $f(x) = ax^2$ runs through point $(3, 6.75)$.
 If the **same function** passes through $y = 42$, what is the value of 'x'
 Round your answer to the nearest **tenth** of a unit (1 decimal place)



Answer: (_____ , 42)

4. A second degree function $f(x) = ax^2$ runs through point $(-4, -7.2)$.
 If the **same function** passes through $x = 20$, what is the value of 'y'



Answer: (20 , _____)

5. A square tile manufacturer *sells tiles* based on the following quadratic function.

$$f(x) = ax^2$$

Where $f(x)$ = sale price of a tile, in dollars (\$)
 x = length of one side of a square tile.

He can sell a 5 cm tile for 0.75\$

The tile he builds is sold for \$ 3.00

The same tile manufacturer *makes tiles* based on the function:

$$f(x) = 0.0225x^2$$

Where $f(x)$ = cost to build a tile, in dollars (\$)
 x = length of one side of a square tile.

How much does it cost the tile manufacturer to make the tile that he sells for \$ 3.00?

7. A Rubik's cube maker **sells** different sized cubes based on the following quadratic function.

$$f(x) = ax^2$$

Where $f(x)$ = sale price of a Rubik's cube, in dollars (\$)
 x = length of one side of the Rubik's cube.

He can sell a 6 cm long Rubik's cube for 9.72 \$

The same cube manufacturer **makes** the Rubik's cubes based on the function:

$$f(x) = 0.12x^2$$

Where $f(x)$ = cost to build a cube, in dollars (\$)
 x = length of one side of the cube.

**The cube manufacturer makes a special order Rubik's cube.
The cube he makes costs him \$27.00 to build.**

Questions:

- How big is the special order Rubik's cube?
- How much money will he sell the special order cube for?
- How much profit will he make in the end?

8. A square tile manufacturer *sells tiles* based on the following quadratic function.

$$f(x) = ax^2$$

Where $f(x)$ = sale price of a tile, in dollars (\$)
 x = length of one side of a square tile.

He can sell a 12 cm tile for 12.96 \$

The same tile manufacturer *makes tiles* based on the function:

$$f(x) = 0.05x^2$$

Where $f(x)$ = cost to build a tile, in dollars (\$)
 x = length of one side of a square tile.

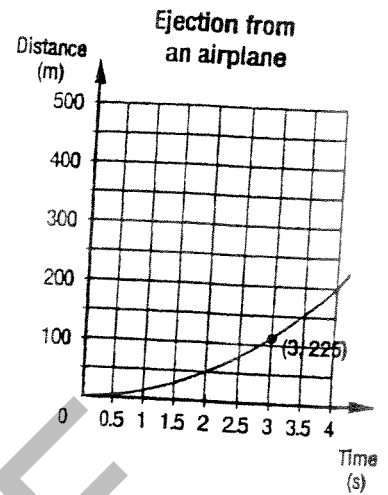
The tile manufacturer makes a tile.

The tile he makes costs him \$1.80 to create.

Questions:

- How much money can he sell the tile for?
- How much profit will he make?

9. During ejection, military aircraft pilots can be subjected to forces 5 to 20 times greater than the force of gravity. The graph below shows the relationship between the time and the distance travelled by a pilot in relation to his ejection point.



- At what distance is the pilot 2.12 seconds after ejection?
- How much time after ejection is the pilot 250 m away from the initial point of ejection?
- The pilot is considered safe if he is more than 300 m from his ejection point. Determine whether or not the pilot is safe if the plane explodes 3.55 s after he has ejected.

Functions - Exponential

Practice Test

1. In 2001, a sum of \$ 4000 is invested at a rate of 6.5% per year for 5 years.
What is the value of the investment when it matures?

 \$

2. An antique painting was purchased in 1980 for \$ 1250.
The value of the painting increases by 8.5% every year.
How much is the painting worth today, in 2016?

 \$

3. The mouse population inside an apartment building is 25 000.
After the exterminators are called, it decreases in size at a rate of 40% per year.
What would the mouse population be after 3 years?

 mice

4. You bought a house 10 years ago. Since that time, the value of real estate in the neighborhood has declined by 3.5% per year. If you initially paid 279 000 \$ for the house, **how much would it be worth today?**

 \$

5. Hunter releases a group of 10 rabbits into a field behind his house. The rabbit population quadruples every 7 months. **How many rabbits would you expect to find in the field after 1 year?**

 rabbits

6. Following renovations, the amount of money spent at the Fairview mall continues to increase. The total, in millions of dollars, can be estimated using the function:

$$y = 12(1.12)^x,$$

where x is the number of years after the renovations.

The renovations took place in 2004.

How much money is being spent in 2016?

Round your answer to the nearest tenth.

 \$

7. In 1976, there were 94 105 girls participating in North American high school sports. Since then, that number has tripled every eight years.
How many girls are participating today (in 2016)?

_____ girls

8. I have \$ 7500 in my account after 6 years investing at 9.5 % per year.
How much money did I start with?

I started with _____ \$.

9. The population of a town has grown at an annual rate of approximately 7 %
How many years will it take for the population of 40 000 people to triple?

It will take _____ years for the population to triple .

Exponential Function: Word Problems

- Rhonda invests \$500 at an annual compound interest rate of 5.5%.
 - Find the rule.
 - How much money will she have after 15 years?
- Today, the average price of a kilogram of coffee is \$18. Importers predict an average annual increase of 4.7% for the next 5 years.
 - Find the rule.
 - How much will coffee cost in 5 years?
- An algae colony triples its population every week.
 - If the population is currently at 25 000, what will it be in 8 weeks?
 - What was the population 2 weeks ago?
- Brandi invests 2000\$ in mutual funds and the bank predicts an annual compound interest rate of 4.5% on average. Melanie invests 1200\$ in different mutual funds, with a mean annual compound interest of 6%.
 - Who will have more money in 10 years?
 - By how much?
- Consider these exponential variations:

$$Y_A = 45\,000 (1.15)^x$$

$$Y_B = 28\,000 (0.8)^x$$

- Which variation will rise on a graph?
- Which variation is decreasing? By how much percent?
- If $x = 5$, find the value of y for each equation.

6. A Mercedes Benz valued at \$100 000 depreciates at a rate of 20% yearly. An \$80 000 Porsche depreciates at a rate of 15% yearly.
- Find the rule for the Mercedes.
 - Find the rule for the Porsche.
 - Which car is worth more after 10 years?
7. Susan and Mike just got their first job. Susan's initial salary is \$30 000 and it will be increased annually by 10%. After x years her salary will be $S = 30\,000(1.1)^x$. Mike's initial salary is \$35 000 with a 5% annual increase.

After x years his salary will be $S = 35\,000(1.05)^x$.

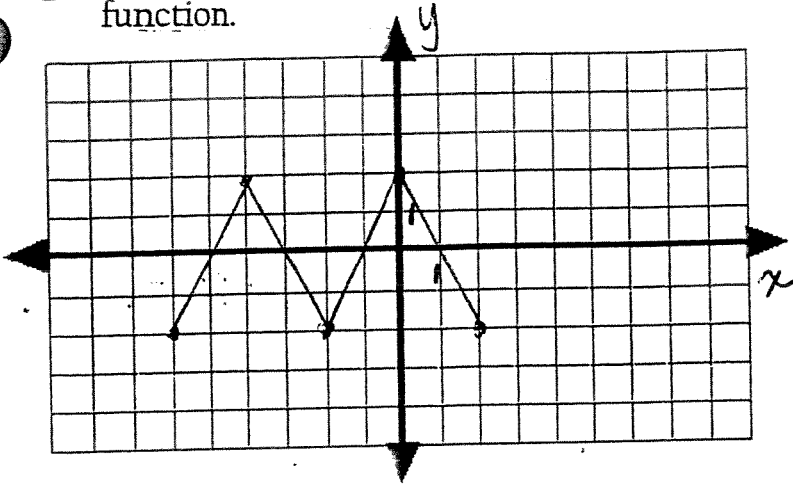
- Construct a table of values showing both salaries from 0 to 5 years.

Years	0	1	2	3	4	5
Susan						
Mike						

- Who will have the higher salary in year 5?
- By how much?

Periodic Function

1 For each of the following, find the period, the frequency and complete the function.

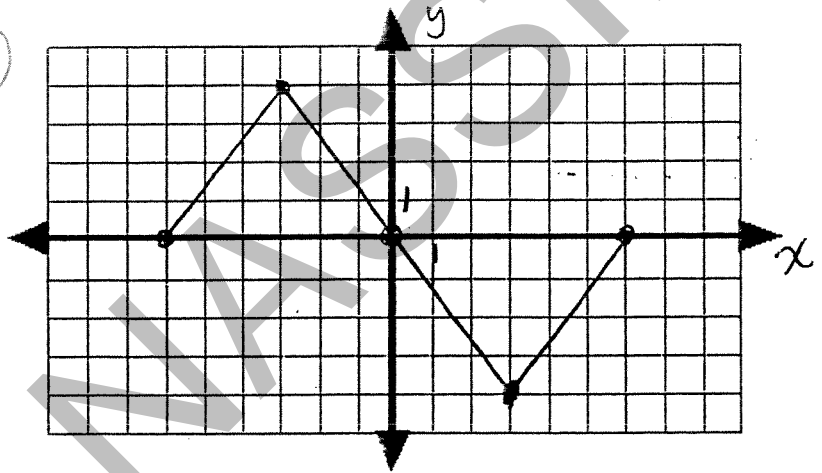


Period = _____

Frequency = _____

$f(30) =$ _____

2

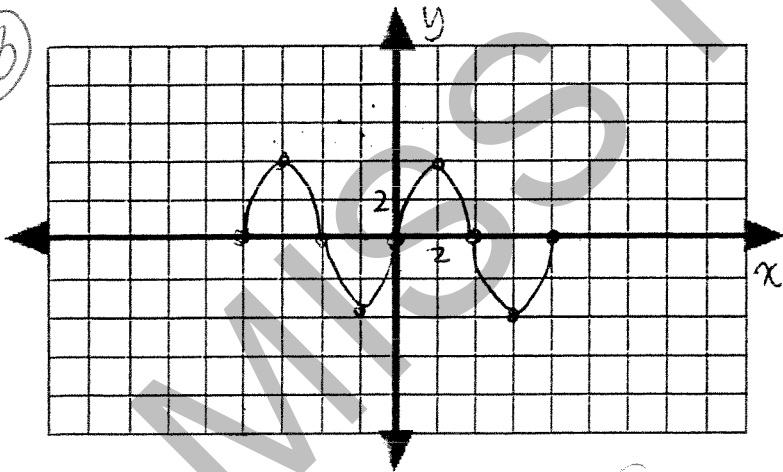


Period = _____

Frequency = _____

$f(12) =$ _____

3

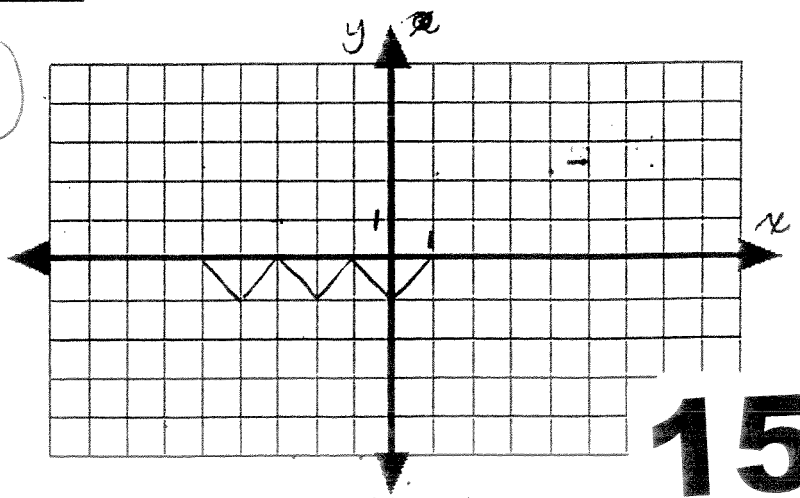


Period = _____

Frequency = _____

$f(40) =$ _____

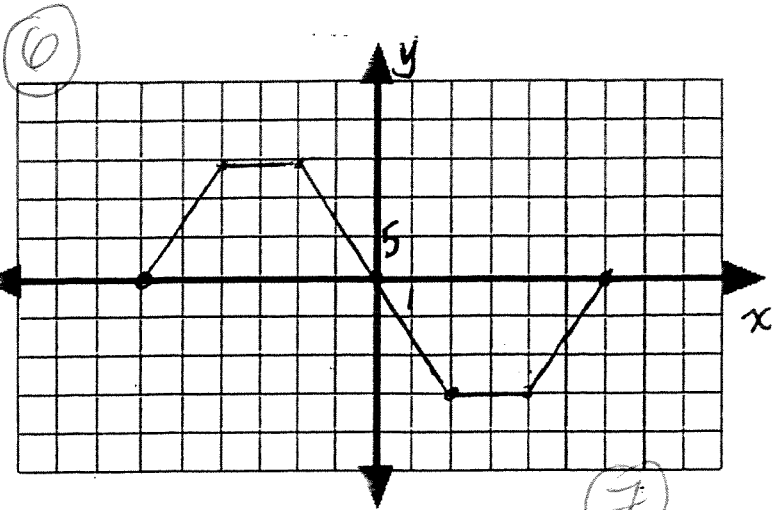
4



Period = _____

Frequency = _____

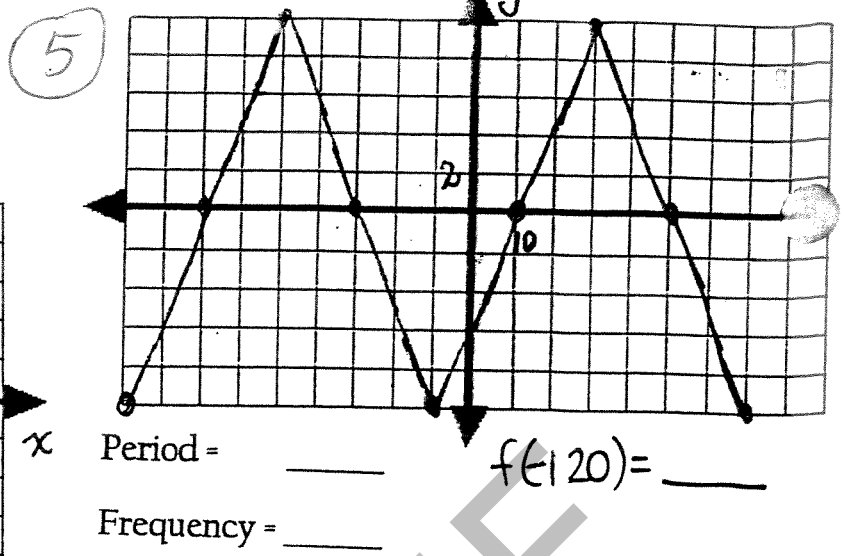
$f(-10) =$ _____



Period = _____

Frequency = _____

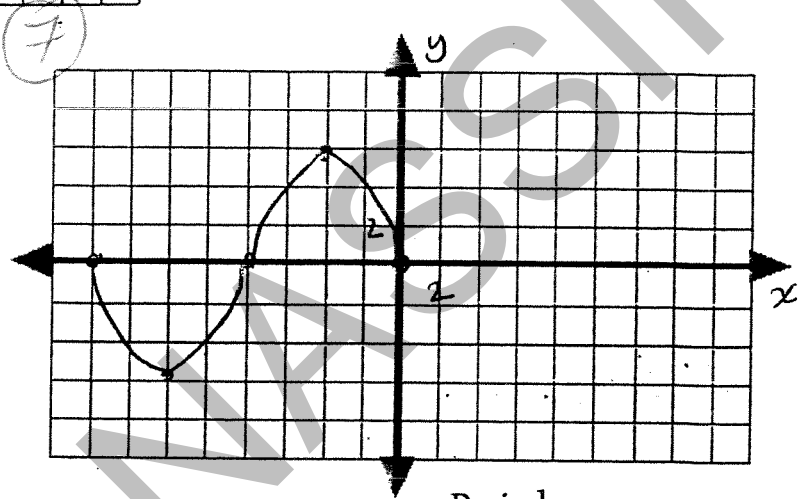
$f(-26) =$ _____



Period = _____

Frequency = _____

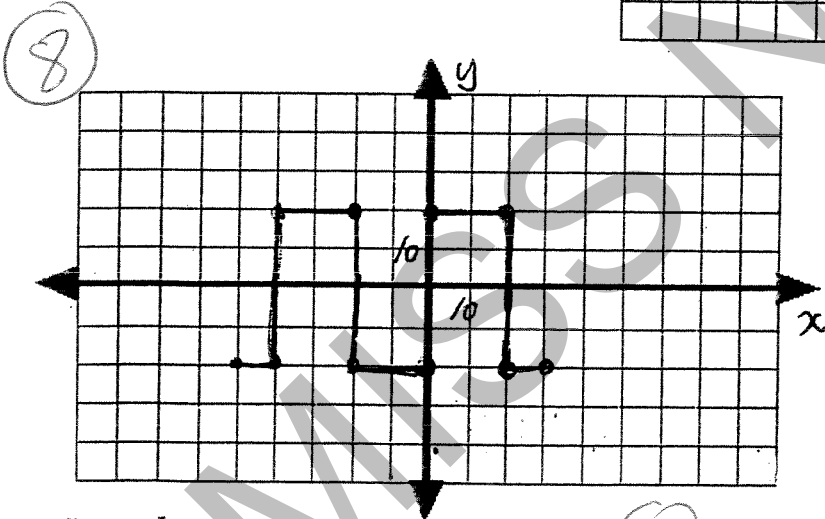
$f(-20) =$ _____



Period = _____

Frequency = _____

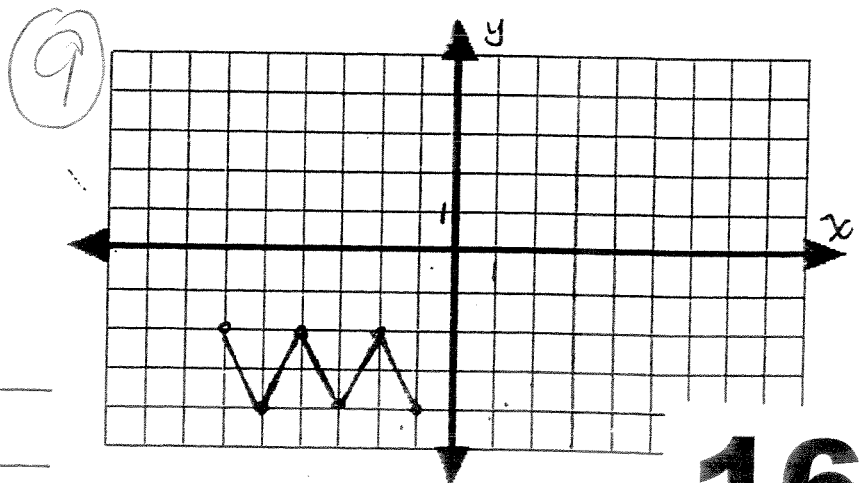
$f(98) =$ _____



Period = _____

Frequency = _____

$f(-210) =$ _____



Period = _____

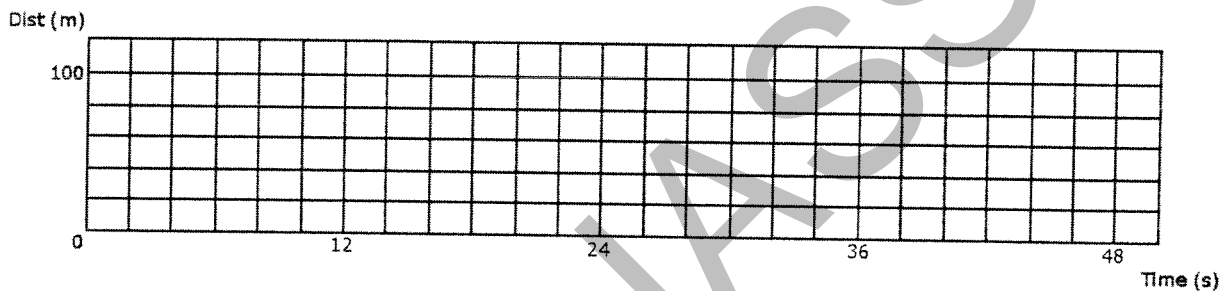
Frequency = _____

$f(-22) =$ _____

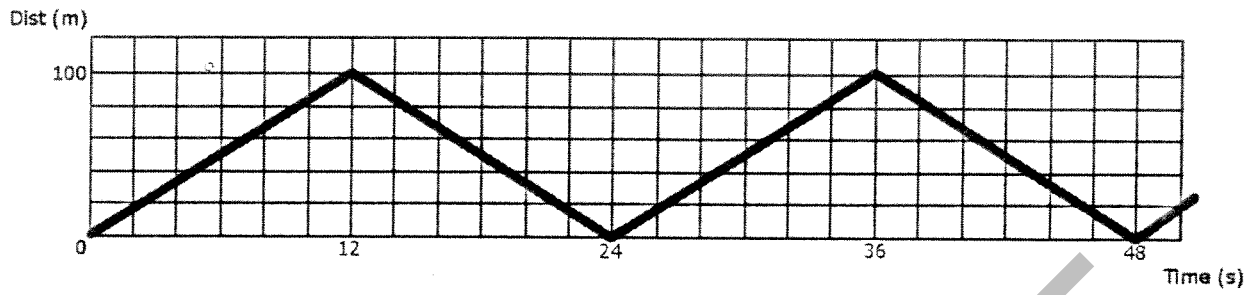
Functions – Periodic

1. Eric is doing a 100 m shuttle run across the gym in Phys. Ed. class. He runs at a constant speed from one end of the gym to the other. His partner measures how far Eric is from the starting point as he runs back and forth. It takes Eric 12 seconds to run from one end of the gym to the other, and **he never stops or slows down.**

- a. Draw a distance vs. time graph that shows Eric performing two complete cycles.



- b. What is the **period** of this function? _____ seconds
- c. If Eric continues this pattern, how far from the starting point will he be after 120 seconds?



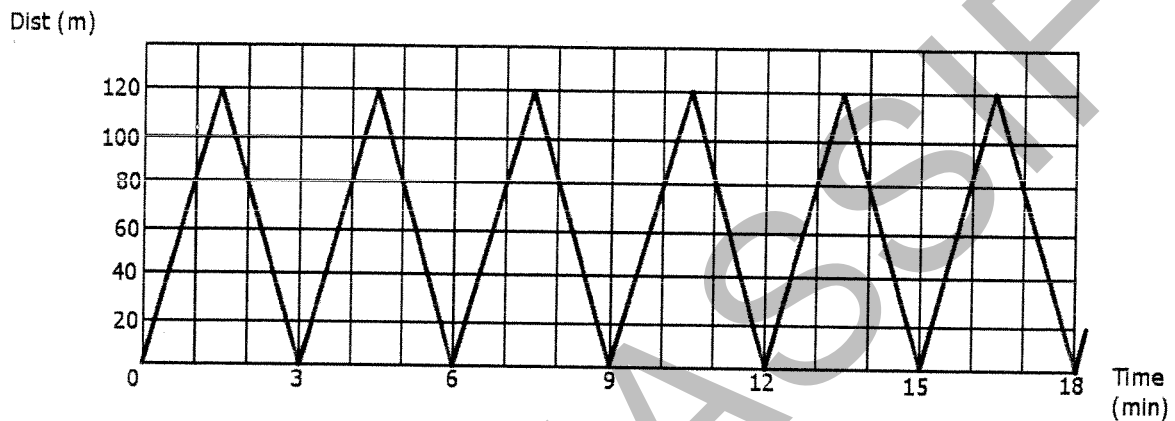
d. At what distance will he be after 5 minutes?

e. At what distance from the start line will Eric be after 5 minutes and 29 seconds?

Functions - Periodic

1. Luis is trying to put out a fire in Mr. Auger's class by getting water from the bathroom and bringing it to the class.

The distance between the washroom and the classroom is 120 m
Luis starts running from the classroom (dist. from the classroom is 0 m).

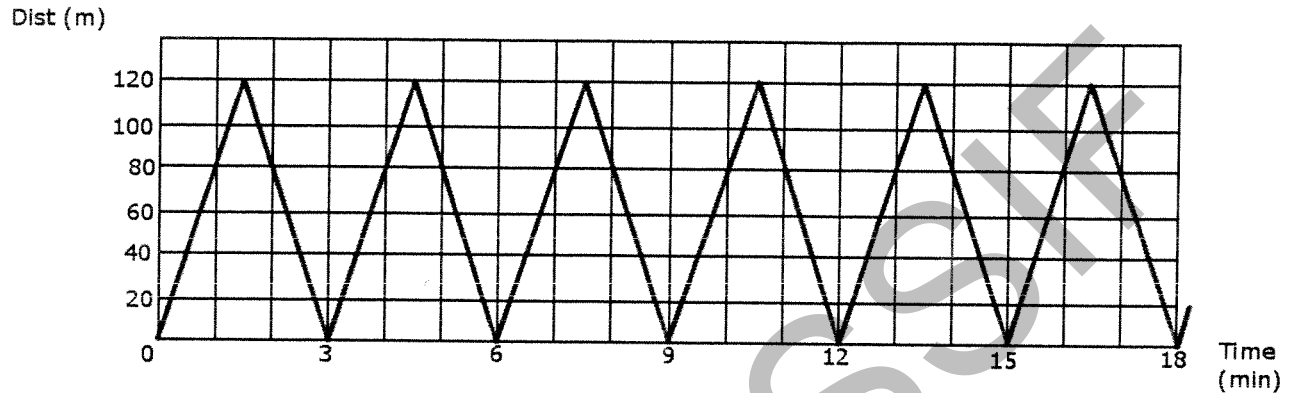


If Luis continues running back and forth for **34 and a half minutes**, how far from the classroom will he be?
(Round your answer to the nearest tenth of a unit)

Answer: After 34.5 minutes, Luis will be _____ meters from the classroom.

2. Anthony is trying to put out a fire in Mr. Auger's class by getting water from the bathroom and bringing it to the class.

The distance between the washroom and the classroom is 120 m
Anthony starts running from the classroom (dist from the class is 0 m).



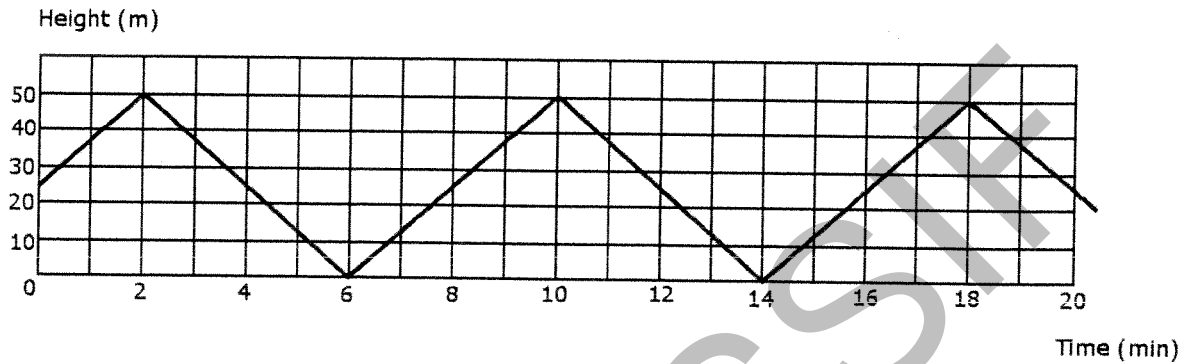
If Anthony collapses from exhaustion after running for **1 hours and 20.5 min.**, how far from the classroom will he be?
(Round your answer to the nearest tenth of a unit)

Answer: After 1 hour and 20.5 minutes, Anthony will be _____ m from the class

3. Gabriela is riding on a Ferris wheel at *LaRonde*.

The wheel has a diameter of 50 m.

When the ride starts, she is already 25 m in the air and rising.



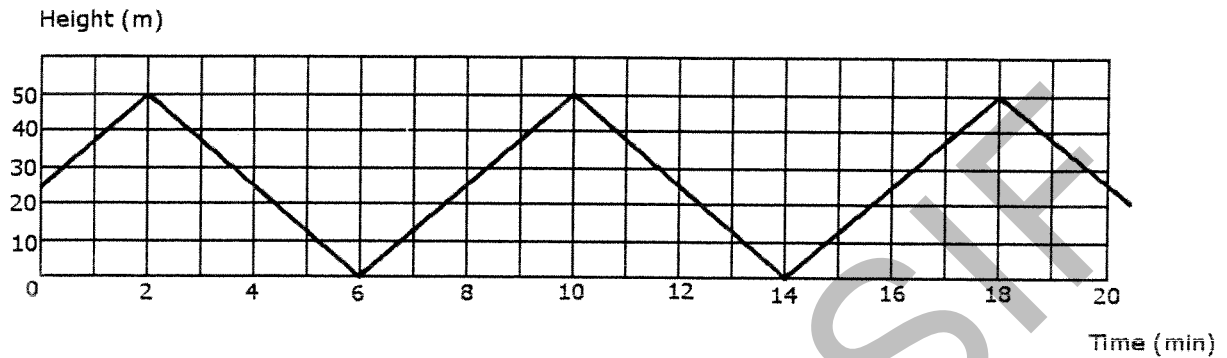
If the ride continues without interruption, at what height will Gabriela be after **one hour**? (Round your answer to the nearest tenth of a unit)

Answer: After one hour, Gabriela will be _____ meters above the ground.

4. Joey is riding on a Ferris wheel at *LaRonde*.

The wheel has a diameter of 50 m.

When the ride starts, Joey is already 25 m in the air and rising.



If the ride breaks down after **2 hours and 5 minutes**, and the fire department's tallest ladder reaches a **max of 11 m**, will Joey be saved? (Round your answer to the nearest tenth of a unit)

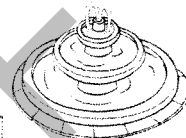
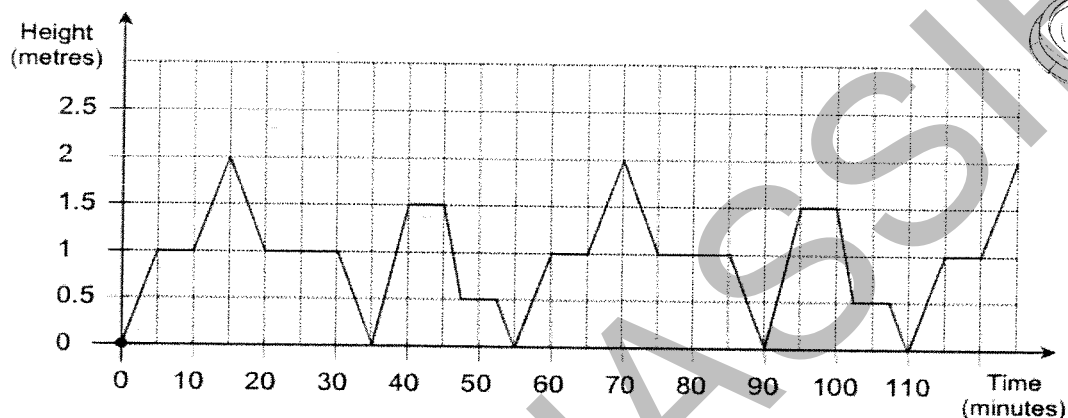
Answer: Joey _____ be saved.

She is _____ m above the ground when the ride breaks.

Functions - Periodic

1. Water shoots out of the middle of a fountain. The height of the jet of water varies.

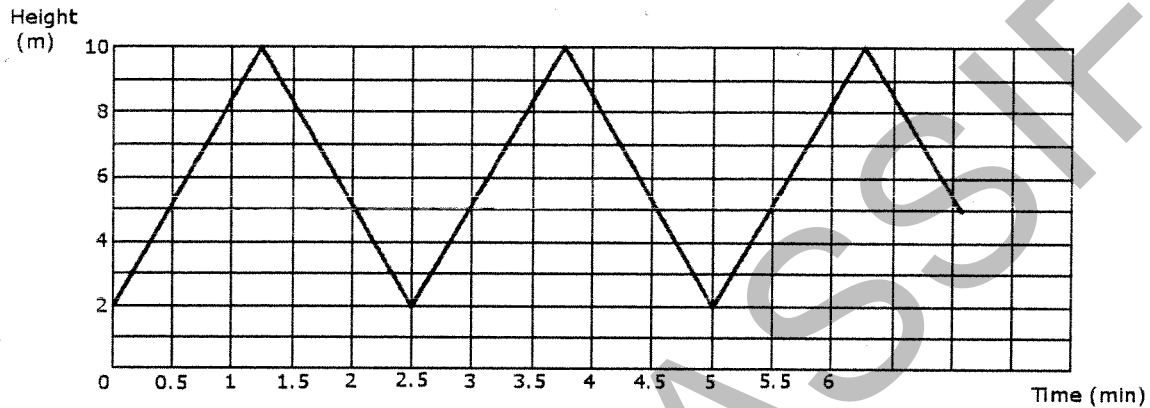
The periodic function represented below can be used to determine the height of the jet of water in relation to the time elapsed from the moment the fountain was turned on.



The water fountain is turned on at 8:00 AM.
What will the height of the water spray be at 2:07 PM?

2. Joanne is riding a surfboard as waves flow past her.
Each wave is exactly the same as the one before and all waves move at the same speed.

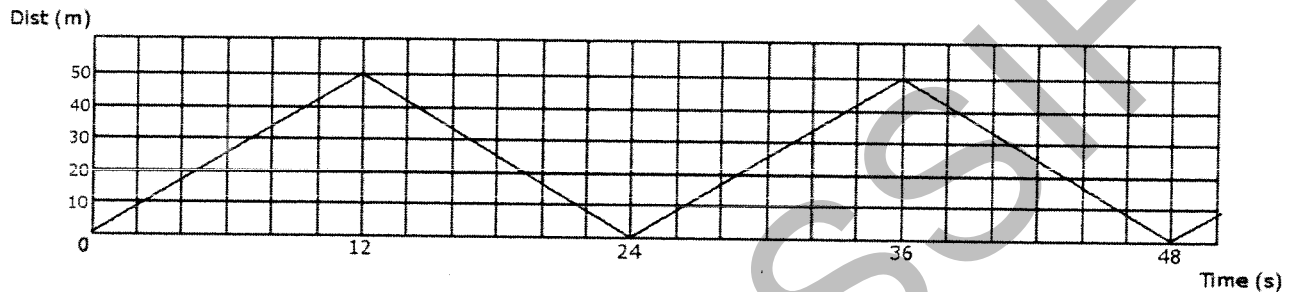
*The max height Joanne attains is 10 m and the minimum height is 2 m.
Exactly 4 waves flow past her in 10 minutes
As time starts, Joanne is at a height of 2 meters.*



At what height will Joanne be after 156 minutes and 42 seconds of surfing?

Functions - Periodic Practice Test

- Charlie is doing a **50 m shuttle** run across the gym in Phys. Ed. class. She runs at a constant speed from one end of the gym to the other. Her partner measures how far Charlie is from the starting point as she runs back and forth. **She never stops or slows down**
It takes Charlie **12 seconds** to run from one end of the gym to the other

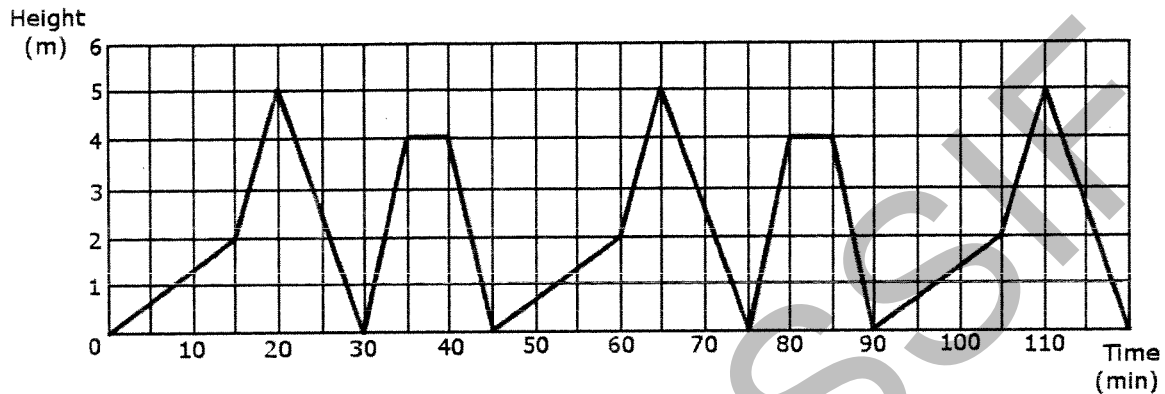


If Charlie continues this pattern, at what distance from the starting point will she be after 15 minutes of running?

Answer: Charlie will be _____ m from the start.

2. Water shoots out of the middle of a fountain.
The height of the jet of water varies with time.

The periodic function represented below shows the height of the water in relation to the time elapsed from the moment the fountain was turned on.



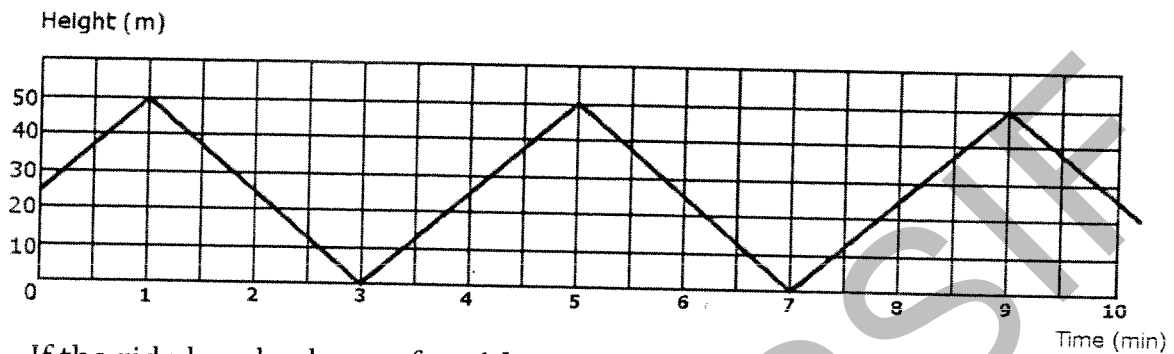
The water fountain is turned on at 8:00 AM.
What will the height of the water spray be at 1:43 PM?

Answer: The height of the water will be _____ m.

3. Mr. Stewart is riding on a Ferris wheel at *LaRonde*.

The wheel has a diameter of 50 m.

When the ride starts, Mr. Stewart is already 25 m in the air and rising.



If the ride breaks down after **1 hours, 15 minutes and 30 seconds**, how **high** up in the air will Mr. Stewart be?

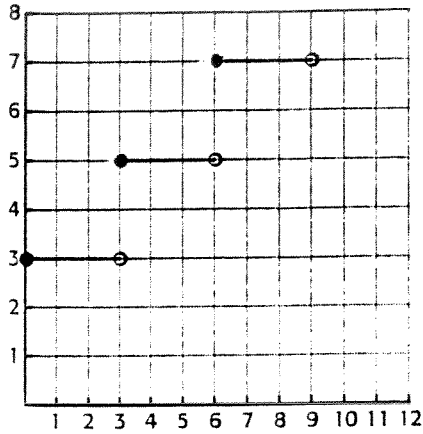
Answer: Mr. Stewart will be _____ m up in the air.

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Reading Step Graphs

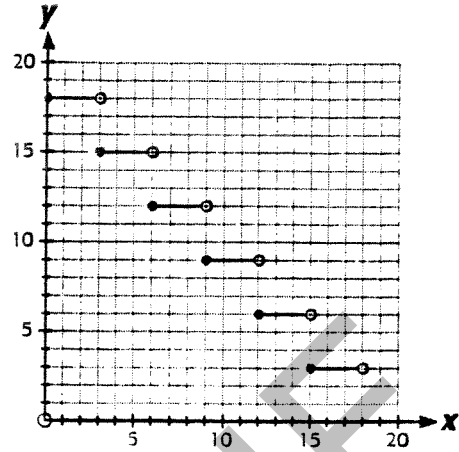
1

Evaluate $f(0)$ in the following function.



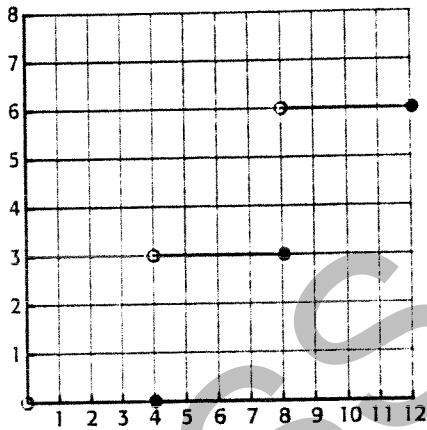
4

Evaluate this function at $x = 12$



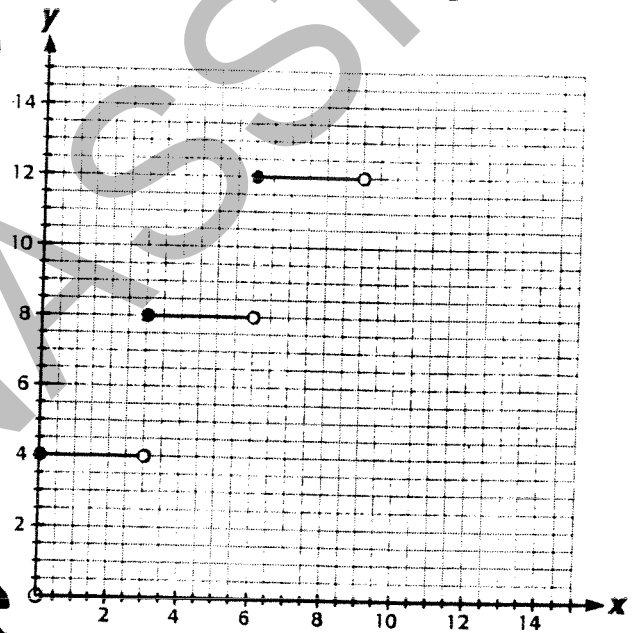
2

Calculate the value of this function when $x = 4$.



5

Evaluate $f(3)$ in the following function:

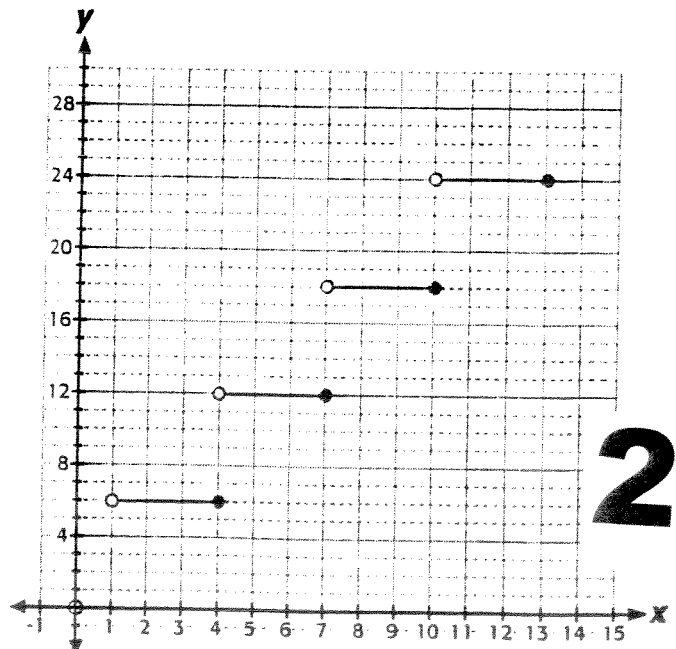
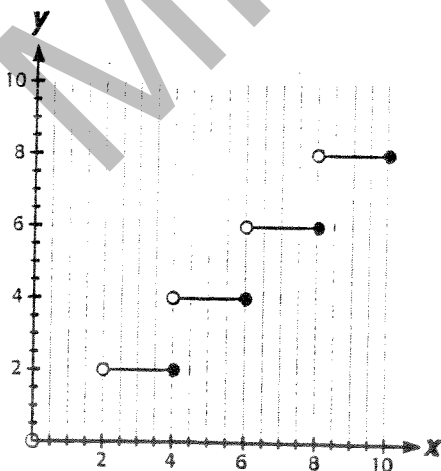


6

Given the following step function, determine the values for which $f(x) = 12$.

3

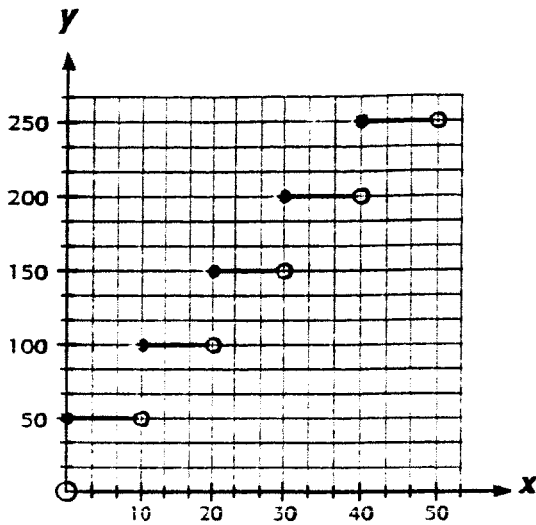
Calculate the value of this function when $x = 4$.



28

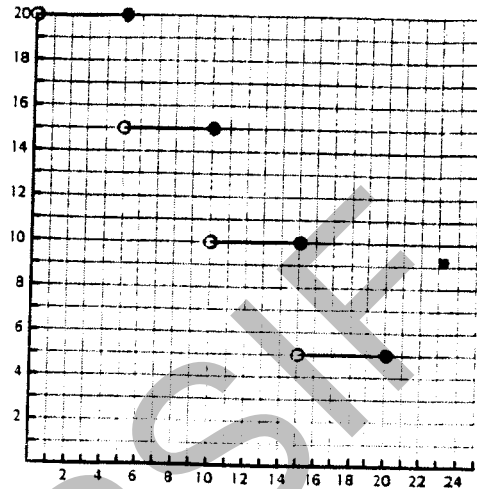
7

Find the interval for which $f(x) = 100$



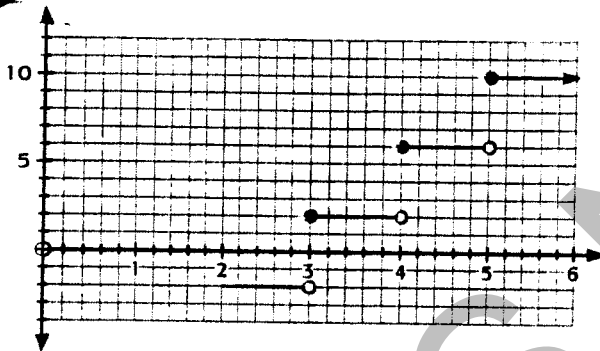
9

Find the interval for which $f(x) = 10$



8

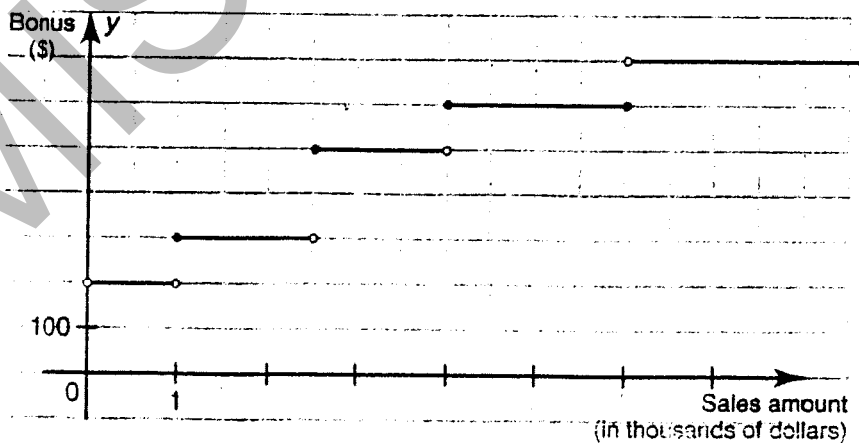
Find the interval for which $f(x) = 6$



10

A salesman, in an appliance store, earns a bonus depending on the amount of his weekly sales.

The following graph illustrates the salesman's weekly bonus as a function of his sales.



Last month, Sylvain made sales of \$1480 the first week, \$3500 the second week, \$2500 the third week and \$4780 the fourth week.

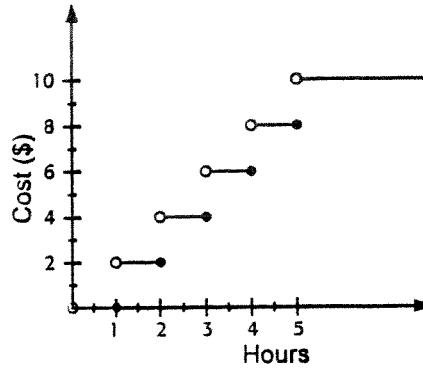
How much did Sylvain receive in bonuses last month?

- A) \$1600
- B) \$12 260
- C) \$1800
- D) \$1900

11

Paul pulls into a downtown parking lot. The prices for parking are shown on a graph like the one below. How much will Paul have to pay for parking in one week if he parks his car for:

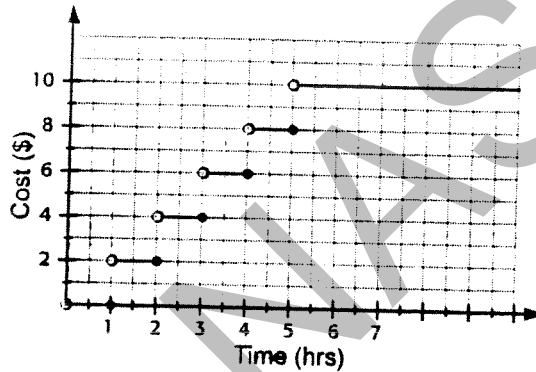
1. 3 hours Monday
2. 2 hours 15 min Tuesday
3. 5 hours 10 min Wednesday
4. 4 and $\frac{1}{2}$ hours Thursday
5. 10 minutes Friday



12

Given the following step function determine which of the statements below are false.

Parking Rates



- a. The first hour of parking is free.
- b. It costs \$4 to park for 3 hours.
- c. It costs \$8 to park for 4 hours.
- d. The maximum cost to park is \$10.

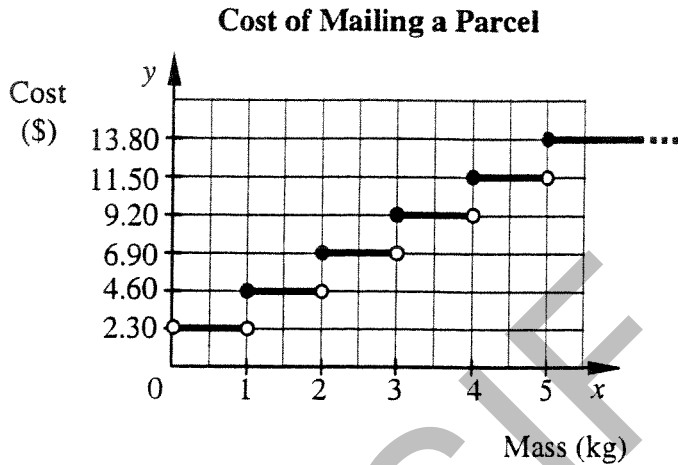
NAME: _____

STEP FUNCTION

- 1 The cost of mailing a parcel depends on its mass.

The graph on the right Represents this situation.

Which of the statements are true? (2 answers)



The cost of mailing a parcel in relation to its mass is detailed below.

1. The cost of mailing a one-kilogram parcel is \$2.30.
2. All parcels weighing over 5 kg are mailed at a fixed cost.
3. There is no cost for mailing a parcel that weighs 0.25 kg.
4. The cost of sending a 5-kg parcel is twice as expensive as sending a 2.5-kg parcel.
5. It costs \$6.90 to mail a parcel weighing less than 3 kg.

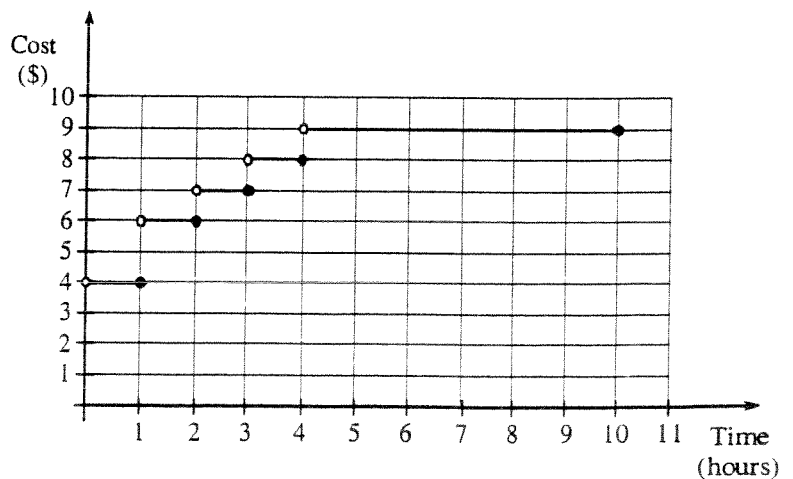
- 2 A downtown Montréal parking lot is open 10 hours a day. The following graph show the amount it costs, in dollars, to park a car on this lot in relation to the time, in hours, it remains parked there.

Consider the following four statements.

- A) To park a car on this lot for 30 minutes, it costs \$2.
B) To park a car on this lot for 1 hour and 1 minute, it costs \$6.
C.) To park a car on this lot for 3 hours, it costs \$8.
D) To park a car on this lot for 8 hours and 15 minutes, it costs \$9.

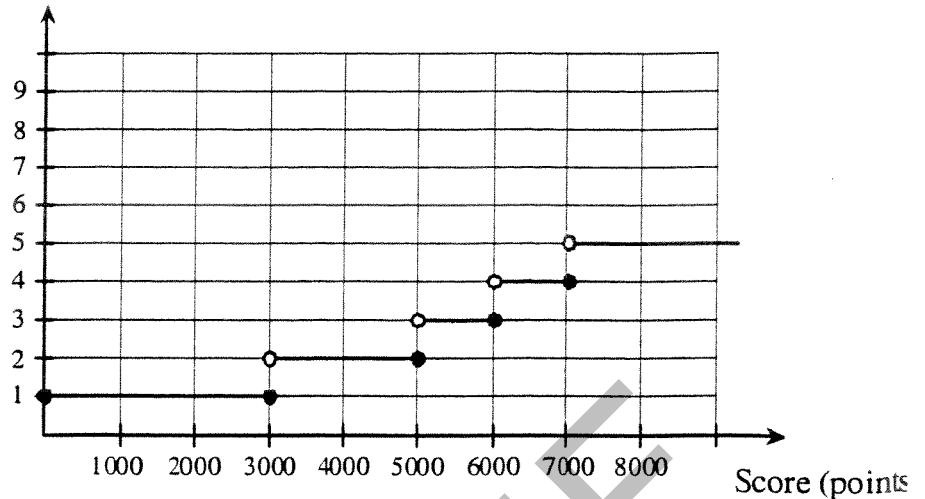
Which of these statements are true?

(2 answers)



Video Game Levels

Level



3

The following graph represents the relation between the level a player reaches and the points scored in a video game.

Which of the following statements must be TRUE?

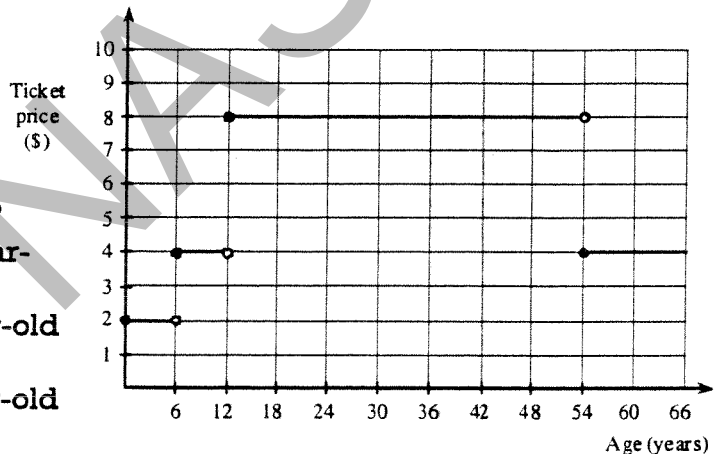
- A) If your score falls between 2000 and 4000 points, you are at level 1.
- B) If your score is 4500 points, you are at level 3.
- C) If your score is 6000 points, you are at level 4.
- D) If your score is more than 7000 points, you are at level 5.

4

The graph below shows that different age groups pay different ticket prices to a sports event.

Which of the following statements is true?

- A. A 12-year-old pays \$4 and a 13-year-old pays \$8
- B. A 6-year-old pays \$2 and a 12-year-old pays \$8
- C. A 7-year-old pays \$4 and a 54-year-old pays \$4.
- D. A 6-year-old pays \$4 and a 54-year-old pays \$8.



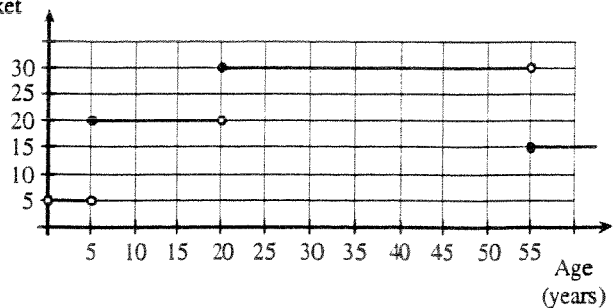
13

The following graph shows the cost of a day ticket to an amusement park according to a person's age.

Helen and Dennis will spend a day at this park with their two children. Helen, Dennis and their children are 52, 55, 15 and 20 years of age, respectively.

What will be the total cost of the day tickets for this family of 4?

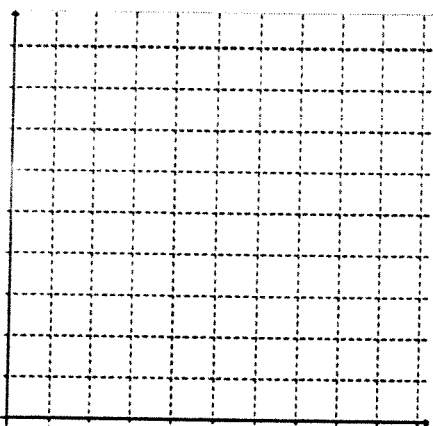
Cost of a Day Ticket (\$)



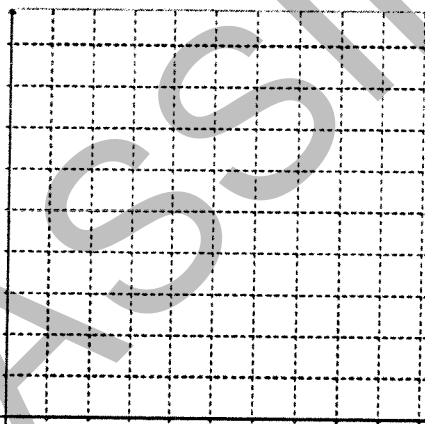
Step Function: GRAPHING

Draw the graph for each situation.

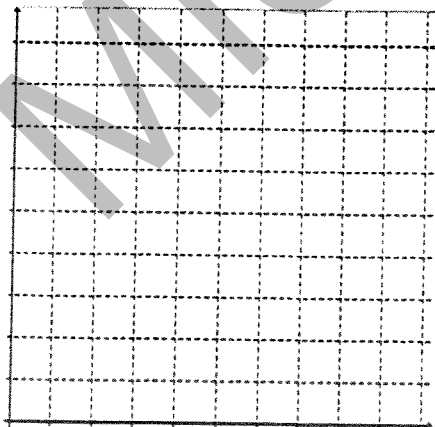
1. A long distance call with Bell costs \$0.50 for the first minute or part of a minute and \$0.40 for every additional minute thereafter.



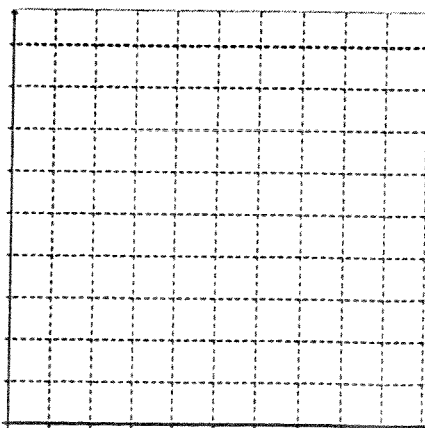
3. A hospital parking lot charges \$5 for the first hour or part of an hour and \$3 for every additional hour or part of an hour.



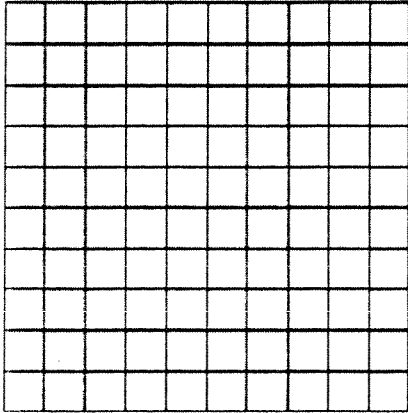
2. A parking lot downtown charges \$4 for the first hour or part of the hour and \$1 for each additional hour or part of an hour. There is a daily maximum rate of 10\$.



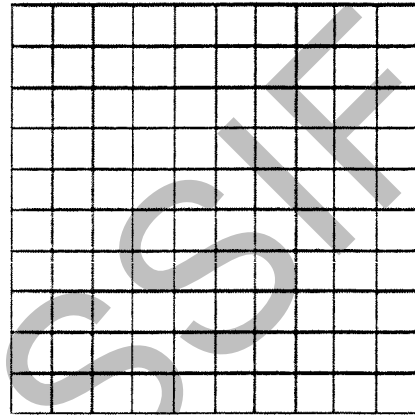
4. A call to Japan costs \$4 for the first half hour or part thereof and \$2 for every additional hour or part thereof.



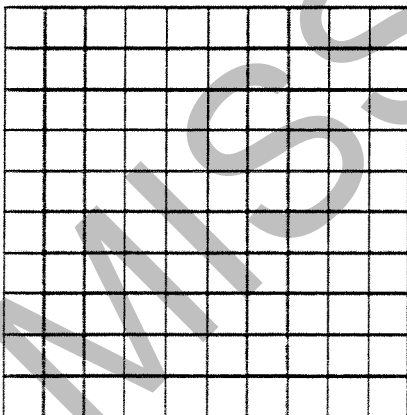
5. Walmart is advertising a discount of 5\$ for every 50\$ purchase.



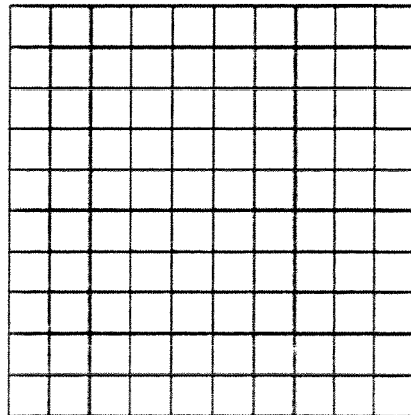
7. IGA is advertising a discount of 3\$ every 20\$ purchase.



6. Sports Expert is advertising a discount of 10\$ for every 100\$ purchase.



8. For every 60\$, Canadian Tire is giving a 15\$ discount.

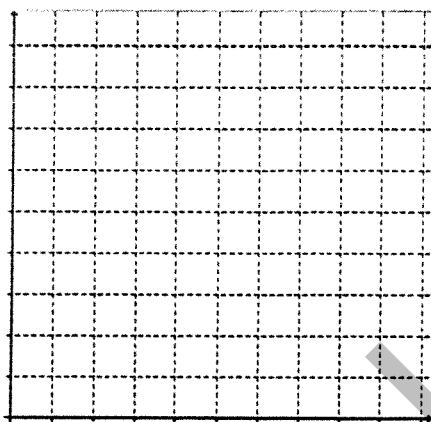


MISS NAASSIF

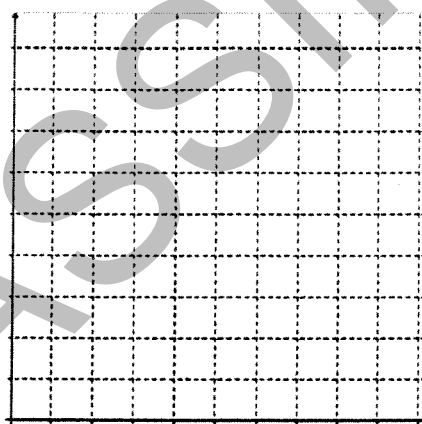
Step Function – GRAPHING

Graph each function.

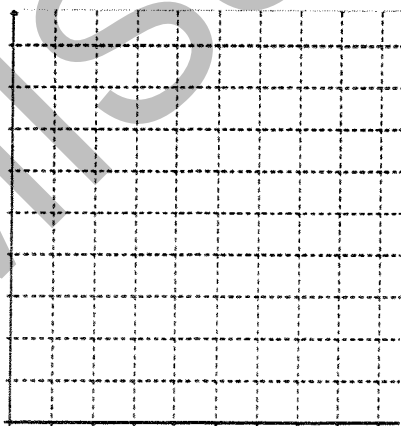
1. $y = 2\left[\frac{x}{3}\right]$



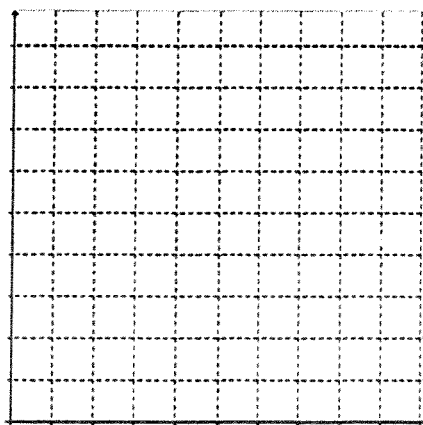
3. $y = 10\left[\frac{2x}{5}\right]$



2. $y = 25\left[\frac{x}{2}\right]$



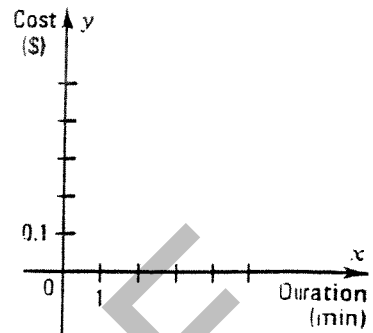
4. $y = 50\left[\frac{x}{100}\right]$



Step Function: Word Problems

1

A telephone company charges for long-distance calls in North America in the following way: \$0.20 for the first minute or fraction of the first minute, plus \$0.10 per additional minute or fraction of an additional minute.



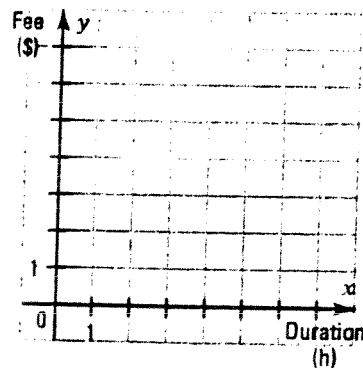
Draw the Cartesian graph of the function f which associates the duration x , in minutes, of a call with its cost y in dollars.

What is the duration of a call that cost \$0.50? _____

3

In a parking lot, the fee y is calculated in the following manner: a minimum cost of \$2 for a parking period of less than 1 hour plus \$1 more for each additional period of less than 60 minutes.

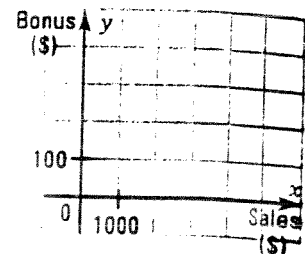
Represent, in the Cartesian plane on the right, the function which associates the parking duration x (in hours) with the fee y (in dollars).



4

To motivate his sales staff, the sales manager offers a \$100 bonus for each \$1000 amount of sales, up to a maximum of \$5000 in sales.

a) Draw the Cartesian graph of the function which associates the amount x of sales with the bonus y received by a salesperson.



c) What is the bonus for a sales amount of \$3500? _____

d) In which interval lies the sales amount if the bonus is \$400? _____

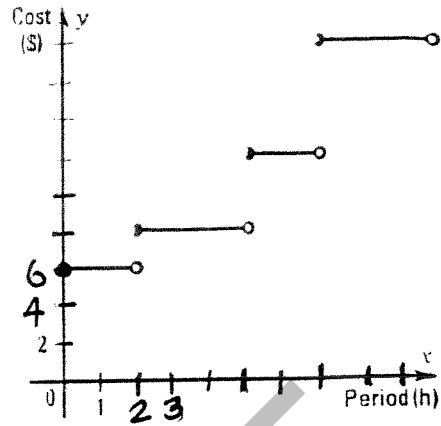
5

The graph on the right shows, depending on the length of the period, the cost of using a recreation centre that is open from 10 am to 8 pm.

What is the cost for a period of

1. 1 h 30? _____ 2. 4 hours? _____

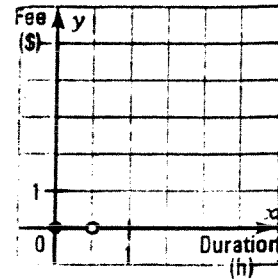
If the cost is \$8, in what interval lies the length x of the period? _____



7

In a parking lot, the fee y is calculated in the following way: a cost of \$1.50 for each incomplete 30-minute period. A period of less than 30 minutes is free.

Draw the graph of the function which associates the parking duration x , in hours, with the fee y , in dollars.



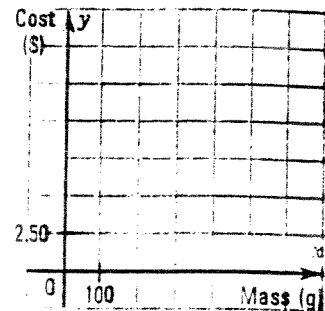
8

The cost (in \$) of sending a parcel depends on its mass (in g). The cost is \$5 for a mass less than 100 g and \$2.50 for each additional 100 g.

Draw the graph of the function which associates the mass x of the parcel with the cost y of sending it.

What is the cost of sending a 325 g parcel? _____

In what interval lies the mass of a parcel if it costs \$15 to send it? _____

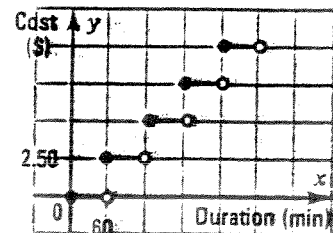


9

The cost of parking in a garage is represented in the Cartesian plane on the right. Consider the function which associates the parking duration, in minutes, with the cost y in dollars.

What is the cost for 2 h 15 min? _____

What is the possible duration if we pay \$12.50? _____



10

The organizing committee for a high school prom decides to hold a talent show to raise money so they can subsidize the cost of the prom.

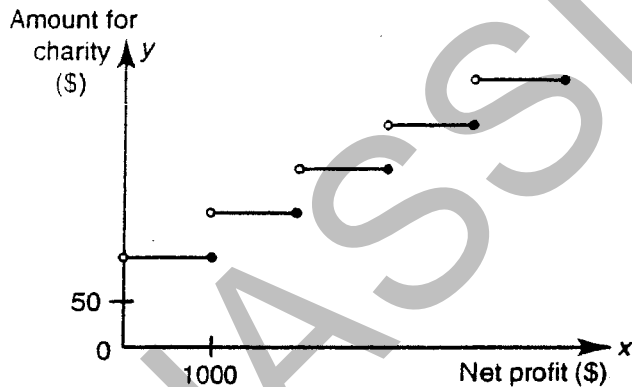
The function that associates the net profit as a function of the number of people attending the show is a linear function.

If there are 200 people in attendance, the net profit will be \$2200.

If there are 300 people in attendance, the net profit will be \$3700.

The organizing committee wants to donate part of the net profit to charity.

The following greatest integer function shows the amount given to charity as a function of the amount of net profit.



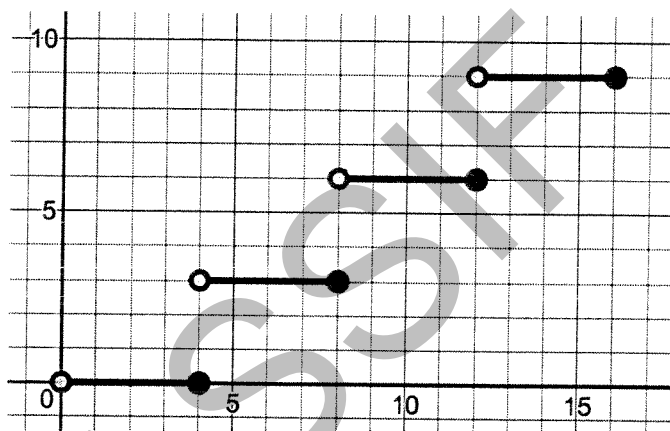
How much will be given to charity if 270 people attend the talent show?

Functions - Step

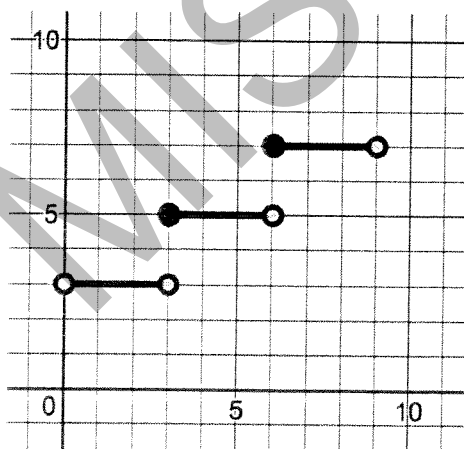
1. Calculate the value of the function when $x = 2$, $x = 4$, $x = 8$, $x = 12$

When

- $x = 2$; $y =$ _____
- $x = 4$; $y =$ _____
- $x = 8$; $y =$ _____
- $x = 12$; $y =$ _____



2. Show that the values of x and y from this step function by building an interval notation table.

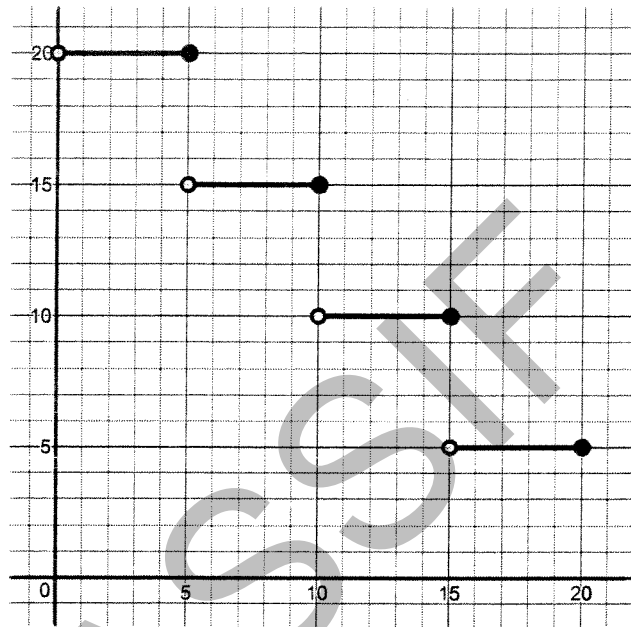


x	y

3. Evaluate this function at $x = 5$, $x = 10$, and $x = 18$

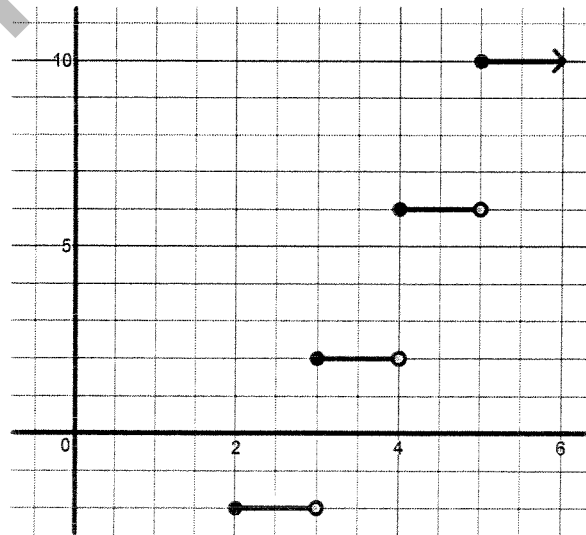
When

- $x = 5$; $y =$ _____
- $x = 10$; $y =$ _____
- $x = 18$; $y =$ _____



4. For what values of x does $y = 6$?

Use both *interval notation* and *inequality notation* in your answer.



Interval Notation: _____

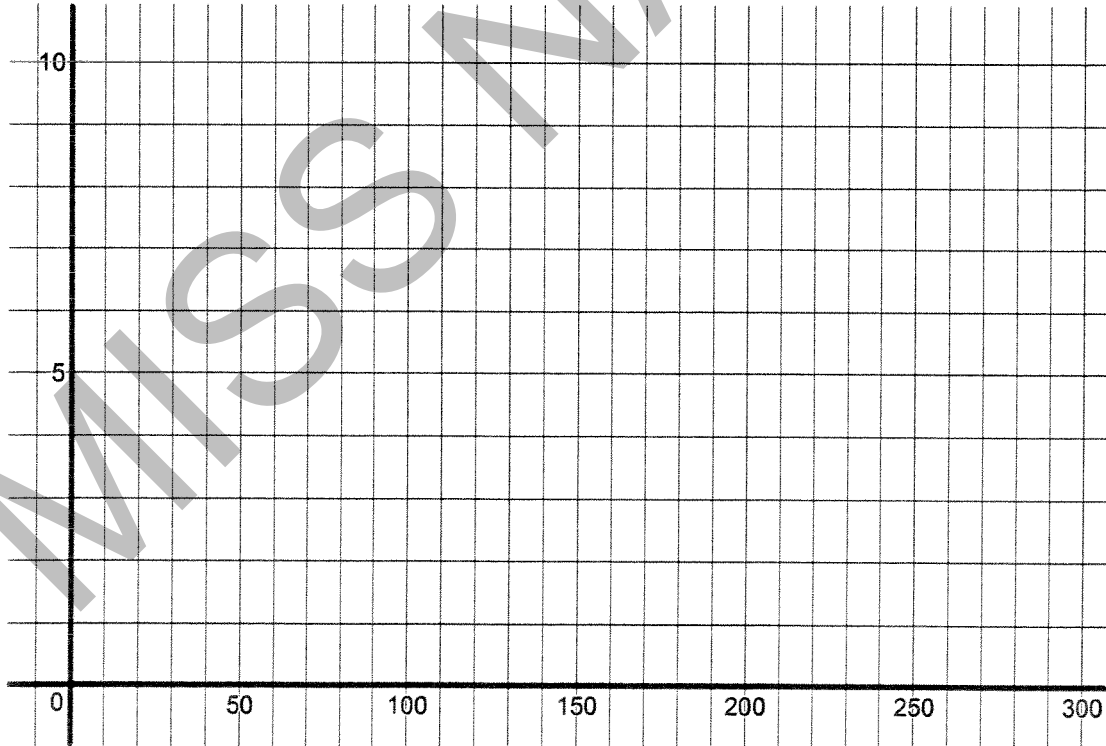
Inequality Notation: _____

5. Represent the following intervals using inequality notation instead of interval notation, then sketch the graph.

x	x	y
$0 < x \leq 50$	$] 0, 50]$	0
	$] 50, 100]$	2
	$] 100, 150]$	4
	$] 150, 200]$	6
	$] 200, 250]$	8

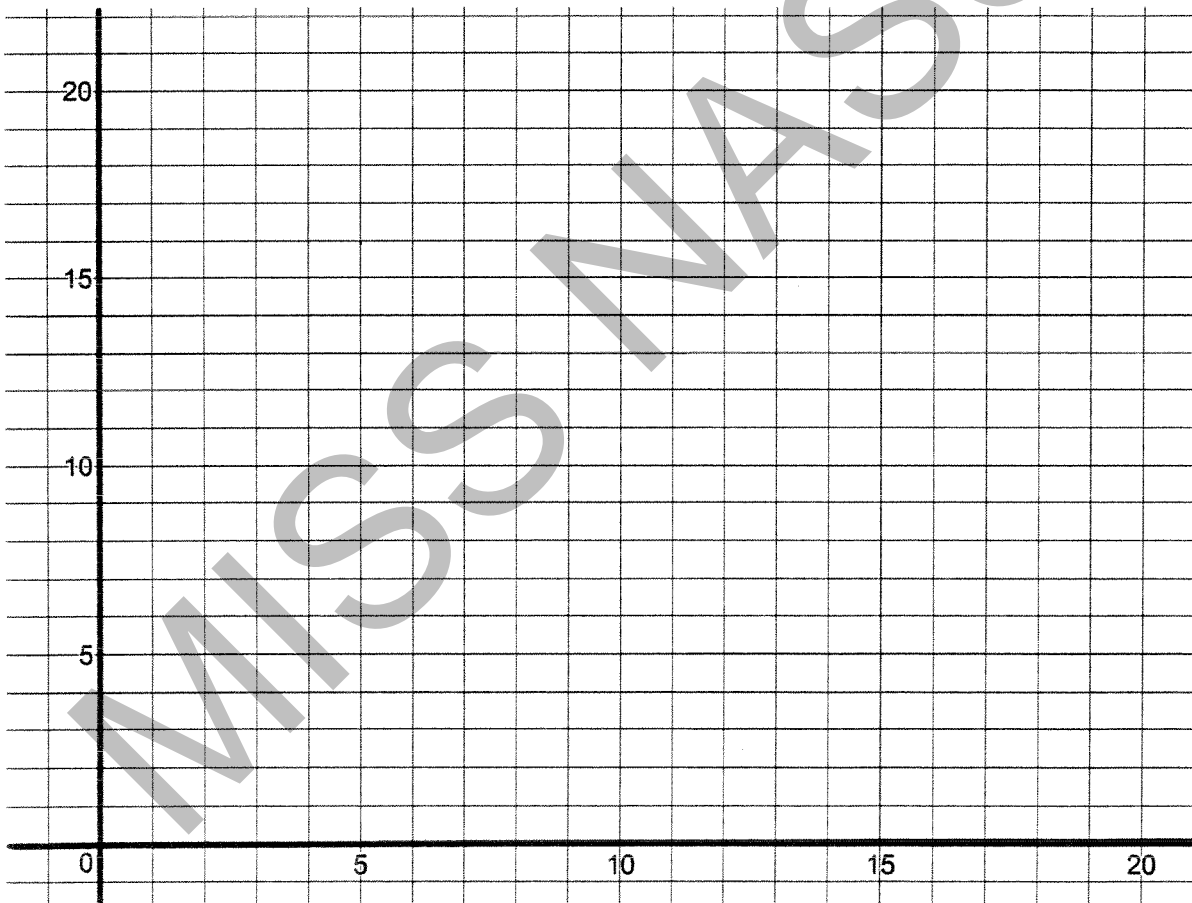
Inequality Notation

Interval Notation



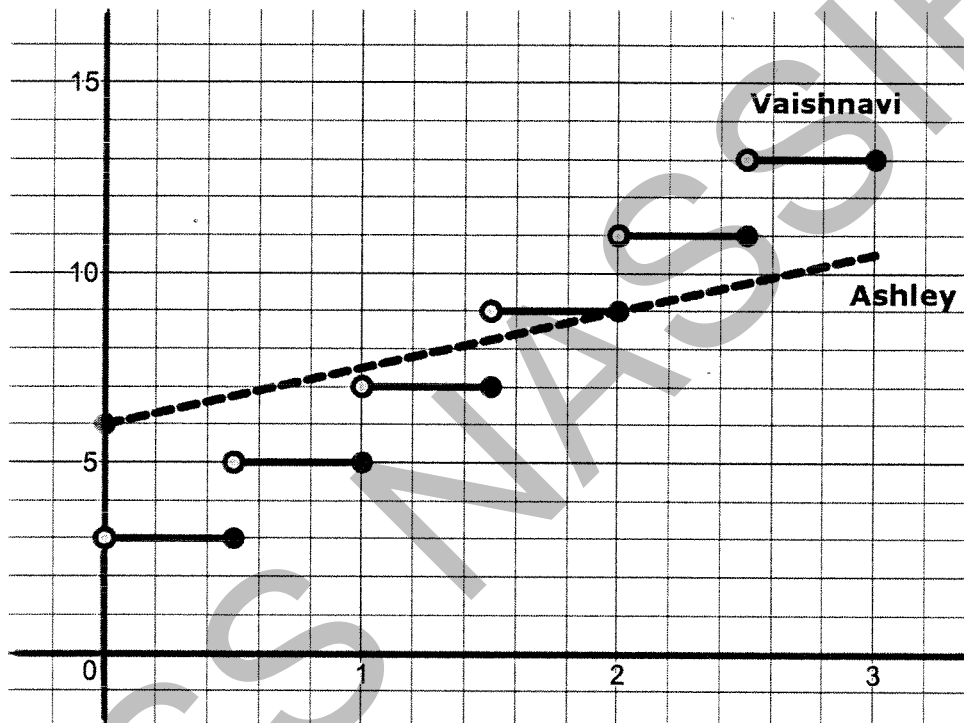
6. Sketch the function represented by the following table of values.

x	y
] 0, 5]	1
] 5, 10]	7
] 10, 15]	13
] 15, 20]	19



7. Ashley tutors and bases her rate on the equation of the line depicted by the graph below. Vaishnavi charges her clients based on the step function.

Describe what circumstances would influence who you would hire if you needed a tutor, assuming they were both good. In other words, use the math to decide.



• I would choose: _____

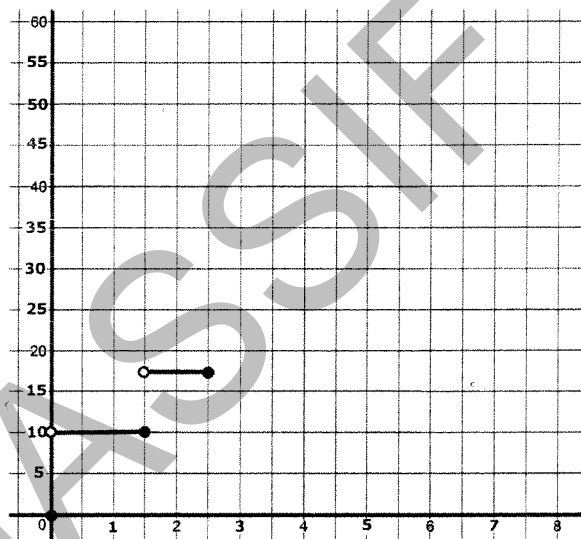
• Because:

Functions – Step –

1. The cost to park a car in a parking lot is \$10 for the first hour and a half and \$7.50 for each additional hour or part thereof.

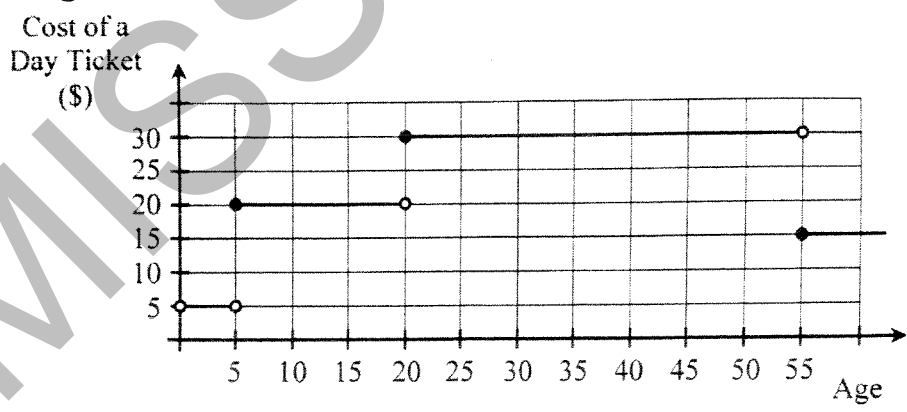
You park your car in this parking lot for **6 hours and 15 minutes**.
How much will the will you have to pay for parking?

x	y



Answer: _____ \$

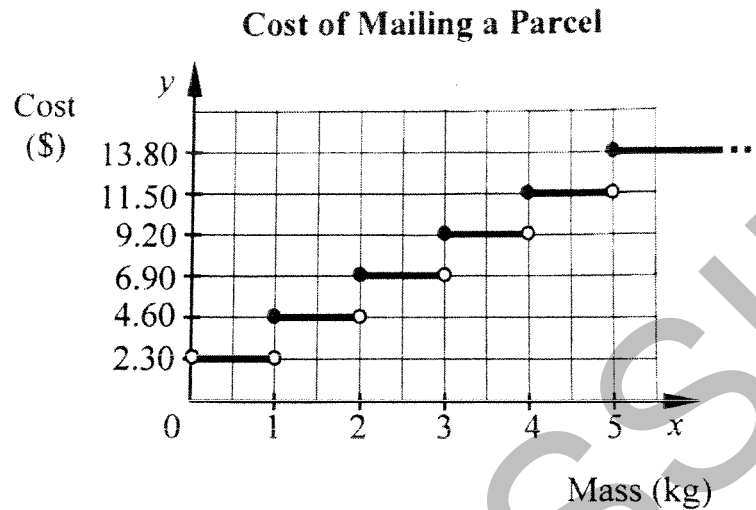
2. The graph shows the cost of a ticket to an amusement park according to a person's age.



Helen and Dennis will spend a day at the park with their two children.
 Helen, Dennis and their two children are **52, 55, 15** and **20** years of age.
 What will be the **total cost** of the day tickets for this family of 4?

Answer: _____ \$

3. The cost of mailing a parcel depends on its mass.



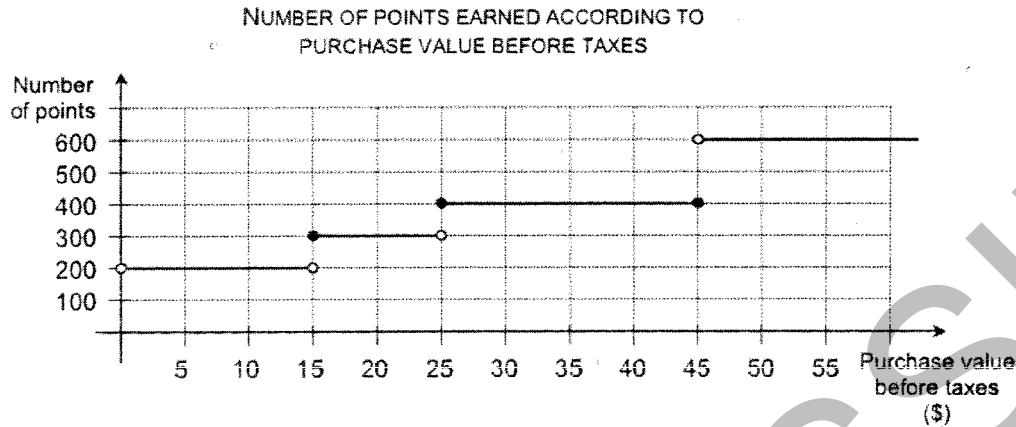
Statements:

1. The cost of mailing a one-kilogram parcel is \$2.30
2. All parcels weighing over 5 kg are mailed at a fixed cost.
3. There is no cost for mailing a parcel that weighs 0.25 kg.
4. The cost of sending a 5-kg parcel is twice as expensive as sending a 2.5 kg parcel
5. It costs \$6.90 to mail a parcel weighing less than 3 kg.

Which of the statements above are true?

- A) 1, 2, and 4 C) 2 and 4
- B) 2, 3, and 5 D) 4 and 5

4. Customers earn points for every purchase they make at a music store. When they have accumulated enough points, they get a gift card.



Rose made three purchases at the store: one on May 8, one on May 15 and one on May 25.

Before taxes, the values of her purchases were \$9.50, \$22 and \$45 respectively.

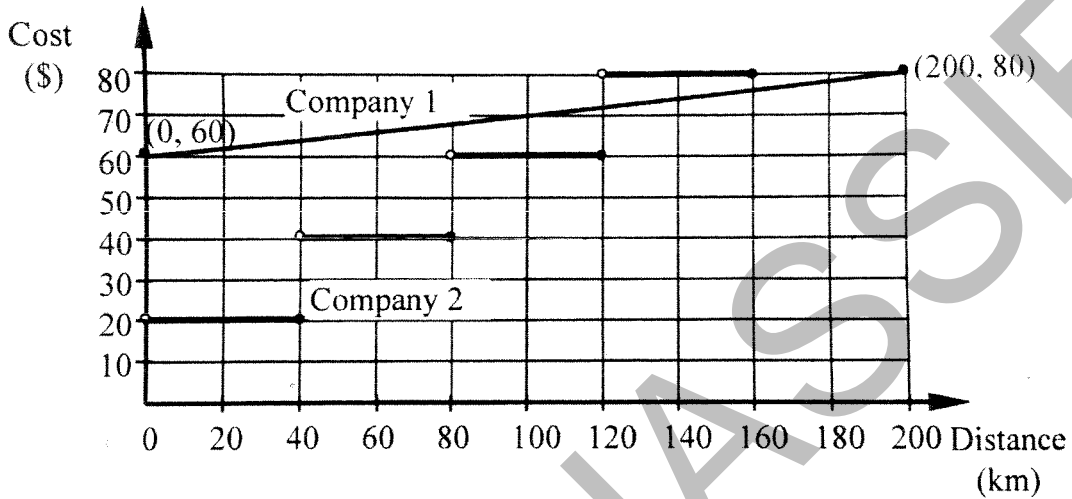
How many points did Rose earn at the music store in May?

- A. 600
- B. 900
- C. 1000
- D. 1100

5. Peter wants to rent a car. He plans to **drive 120 km**.

He checks the rental costs at two rental companies, Co. 1 and Co. 2.

The graph below shows how cost and distance travelled work for each company.



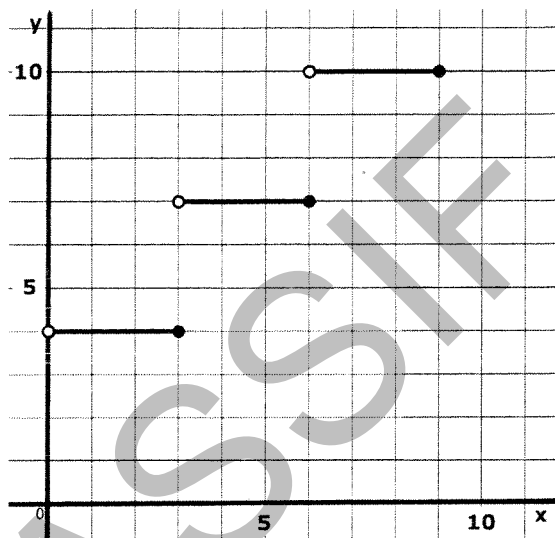
What is the **difference** in the rental cost between the two companies?

Answer: The difference will be: \$ _____

Functions - Step

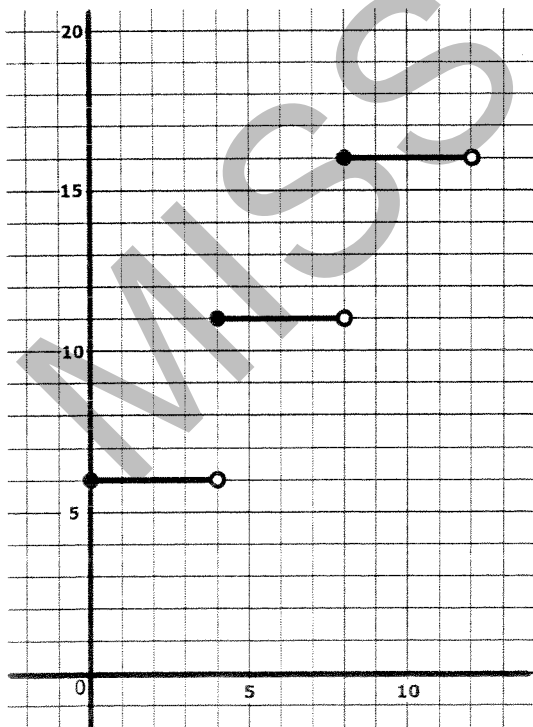
1. Using the graph at right, **predict** the value of **y** when **x = 21**.

x	y



Answer: (21 , _____)

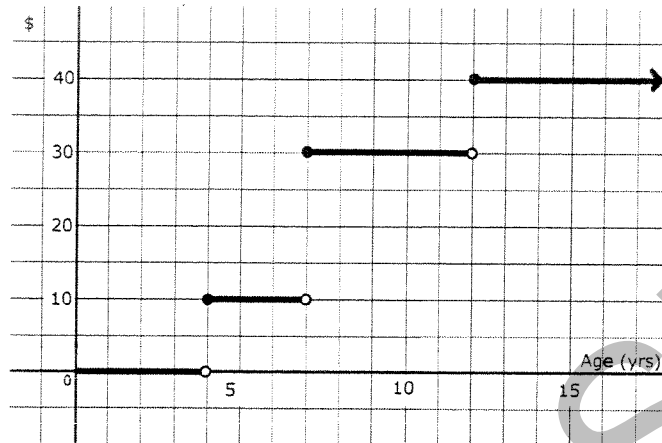
2. Using the graph below, predict the value of **y** when **x = 24**



x	y

Answer: (24 , _____)

3. The following graph shows the cost of a ticket to the Ecomuseum given a person's age.



As part of a science project, Dan, Jay, Miles, Harry and Chuck visit the park.

- Dan and Jay are both 14 years old
- Miles is 12
- Harry is 4
- Chuck is 6

What will be the *total cost* for this group to visit the Ecomuseum?

Total cost _____ \$

4. The cost to park a car in an expensive lot is **\$30 for the first two and a half hours** and **\$6.00 for each additional hour or part thereof**.

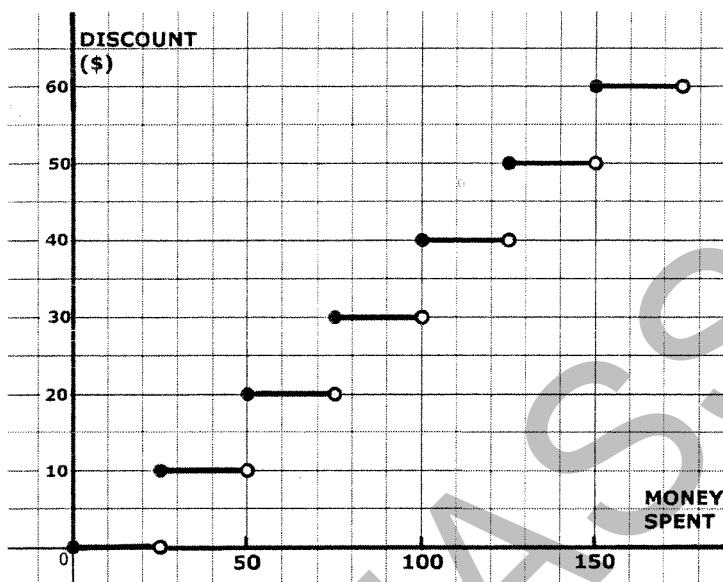
A customer uses this parking lot for **6 hours**.

How much will the customer pay for parking?

The customer will pay _____ \$

5. A store offers a discount of \$ 10 for every \$ 25 in purchases.

The graph shows the value of the purchases (x) and the amount of discount a customer receives (y).



Consider the following five statements regarding the graph.

- 1) A customer who spends \$100 will receive a \$40 discount.
- 2) A customer who spends \$75 will receive a \$20 discount.
- 3) A customer will receive a \$10 discount when spending less than \$50.
- 4) A customer will receive twice as much of a discount when spending \$150 versus \$75.
- 5) A customer will receive no discount when spending \$25 or less

Which of the statements above are true?

- A. 2, 3 and 5
- B. 2, 3 and 4
- C. 1, 4 and 5
- D. 1 and 4

Answer: _____

6. Here is the discount advertised at a clothing store.

DISCOUNT
Get \$7 off for every \$20 you spend before taxes.

Laura bought a sweater at this store and got a discount of \$ 28.

Sam bought a sweater and a pair of mittens at the same store. She got a discount of \$42. The price of the mittens was \$24.99

The price of Sam's sweater was the same as Laura's sweater.

What are the possible prices, before taxes, of the sweater Laura bought?

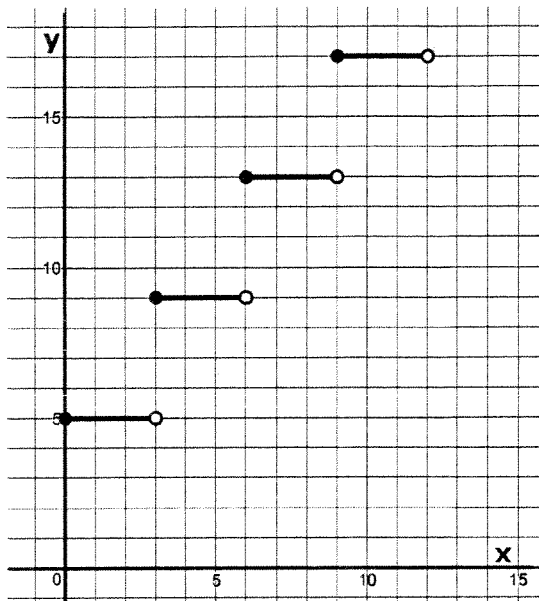
Answer:

The possible prices, before taxes, of the sweater are: _____

Functions - Step

Practice Quiz

1. Using the graph at right, predict the value of y when $x = 18$.

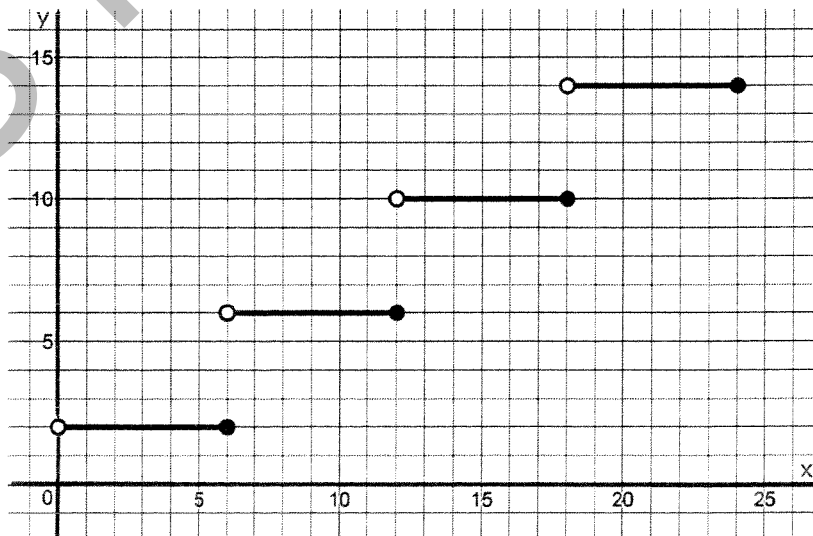


x	y

Answer: (18 , _____)

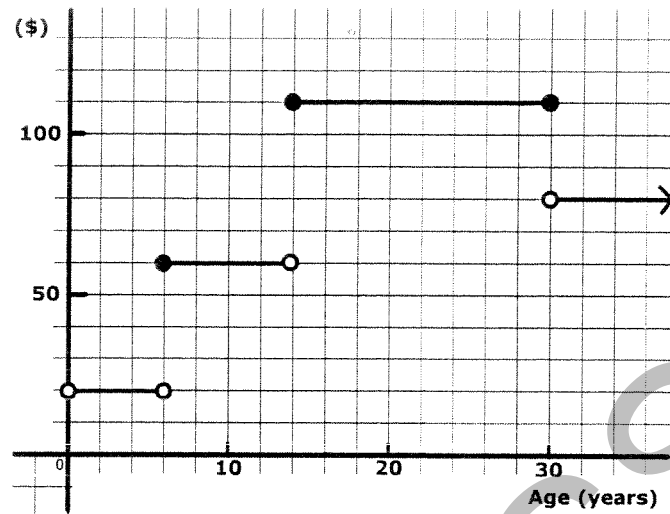
2. Using the graph below, predict the value of y when $x = 32$.

x	y



Answer: (32 , _____)

3. The following graph shows the cost of a ticket to Disney given a person's age.



Steve and Joanie bring their 3 kids: Mike, Dan and Jay to visit the happiest place on Earth

- Steve and Joanie are both 43
- Dan is 12
- Mike is 6
- Jay is 30 (and adopted)

What will be the *cost* for the group to visit Disney?

Total cost _____ \$

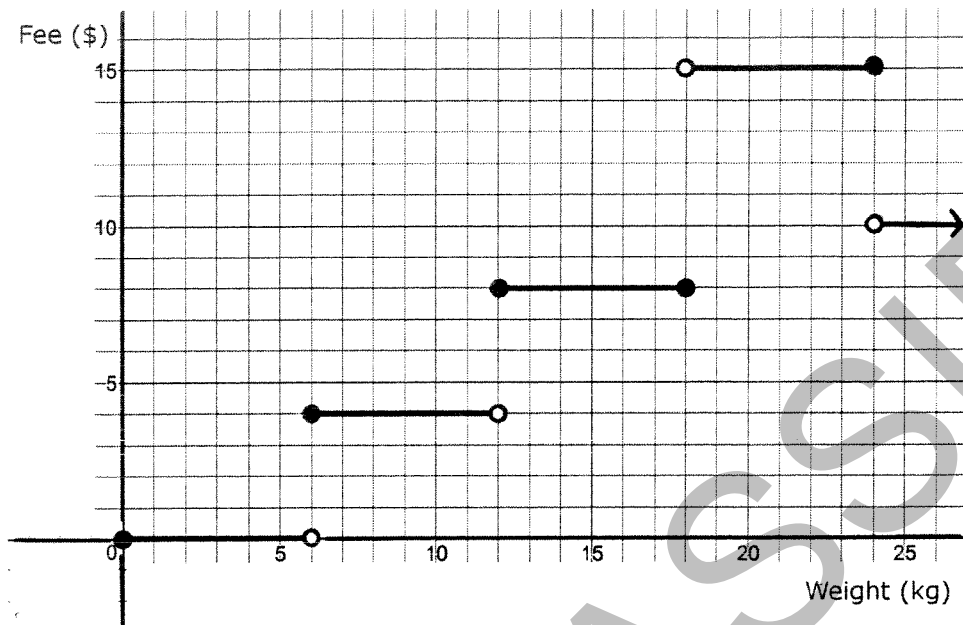
4. The cost to park a car in an expensive lot is **\$60 for the first hour and a half** and **\$20 for each additional two hours or part thereof**.

A customer uses this parking lot for **6 hours**.

How much will the customer pay for parking?

The customer will pay _____ \$

5. An airline charges a fee for baggage that passes a given weight limit.



Consider the following five statements regarding the graph.

- 1) A passenger with a bag weighing 15 kg will pay a fee of \$ 8
- 2) A passenger with a bag weighing less than 12 kg pays a fee of \$ 4 .
- 3) A passenger will pay a flat fee for luggage weighing more than 24 kg.
- 4) A passenger will pay twice as much for a bag weighing 18 kg as for one weighing 12 kg.
- 5) A passenger will pay no fee for a bag weighing 6 kg or less.

Which of the statements above are true?

- A. 1, 2 and 3
- B. 1 and 3
- C. 1, 3 and 4
- D. 1, 3, and 5

Answer: _____

6. Here is a discount advertised at a sporting goods store.

DISCOUNT
Get \$4 off for every \$ 40 you spend before taxes.

Jim bought a tennis racket at this store and got a discount of \$ 20.

Jen bought a tennis racket and a case at the same store.
She got a discount of \$24. The price of the case was \$53

The price of Jim's racket was the same as Jen's racket.

What are the possible prices, before taxes, of the racket Jim bought?

Answer: The possible prices, before taxes, of the racket are: _____

MISS NAASSIF

Piecewise Functions Worksheet

Find the following: $f(-2)$ and $f(10)$

Read from an equation

$$1) f(x) = \begin{cases} 3x+2, & x \leq -4 \\ -4, & x > -4 \end{cases}$$

$$2) f(x) = \begin{cases} -2x-4, & x \geq 3 \\ x+4, & x < 3 \end{cases}$$

$$3) f(x) = \begin{cases} -2x-5, & x \leq 2 \\ \frac{1}{2}x+5, & x > 2 \end{cases}$$

$$4) f(x) = \begin{cases} 3, & x \leq -2 \\ -2-4x, & -2 < x < 3 \\ x^2-1, & x \geq 3 \end{cases}$$

$$5) f(x) = \begin{cases} x+7, & x \geq 4 \\ -2x, & 0 \leq x < 4 \\ 5, & x < 0 \end{cases}$$

$$6) f(x) = \begin{cases} -3x+1, & x \leq 6 \\ \frac{2}{3}x+3, & x > 6 \end{cases}$$

$$7) f(x) = \begin{cases} -x^2-2, & x \leq 0 \\ -1, & x > 0 \end{cases}$$

$$8) f(x) = \begin{cases} 3x-2, & x \leq -2 \\ x^2+1, & -2 < x < 1 \\ 6, & x \geq 1 \end{cases}$$

$$9) f(x) = \begin{cases} x+3 & \text{if } x \leq -1 \\ \frac{2}{3}x + \frac{2}{3} & \text{if } -1 < x < 2 \\ \frac{2}{3}x + \frac{2}{3} & \text{if } x \geq 2 \end{cases}$$

$$10) f(x) = \begin{cases} 0.5x^2 & \text{if } -2 \leq x \leq 4 \\ x+4 & \text{if } 4 \leq x \leq 10 \\ -2x+34 & \text{if } 10 \leq x \leq 17 \end{cases}$$

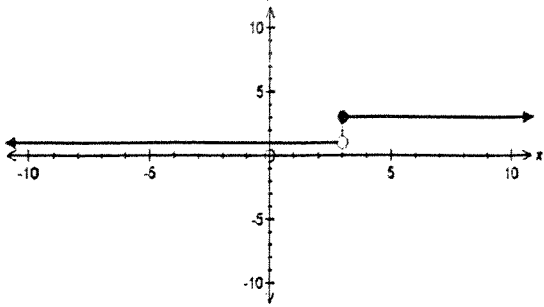
$$11) f(x) = \begin{cases} -2x+1 & x \leq 2 \\ 5x-4 & x > 2 \end{cases}$$

$$12) f(x) = \begin{cases} x+5 & x < -2 \\ x^2+2x+3 & x \geq -2 \end{cases}$$

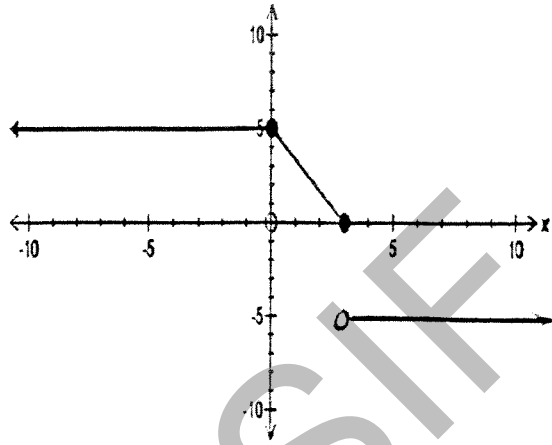
Piecewise Functions

Read from the graph

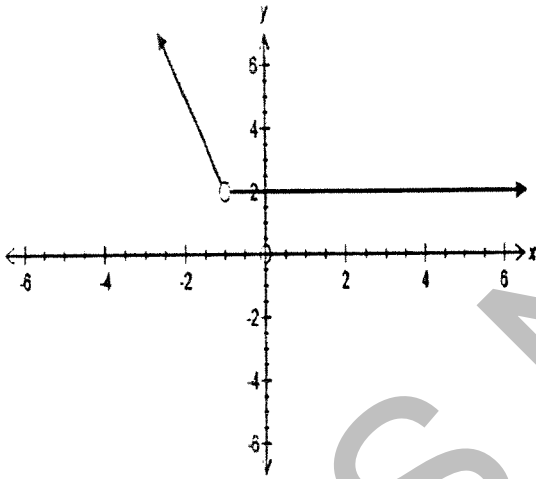
1) $f(0) =$



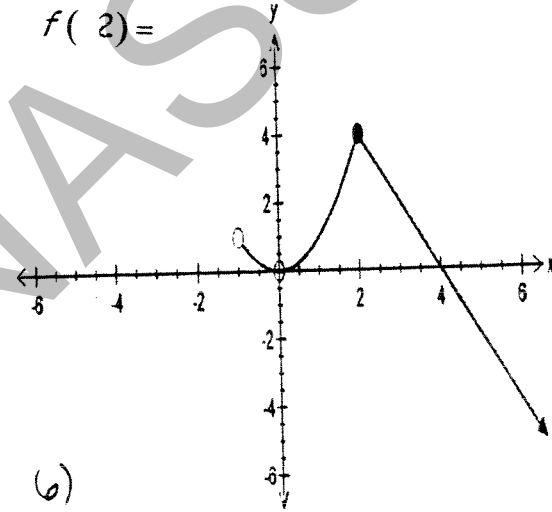
2) $f(8) =$



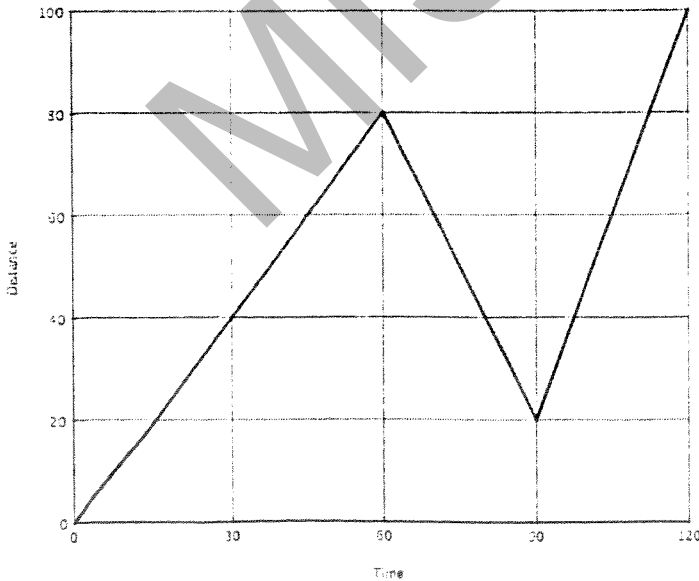
3) $f(2) =$



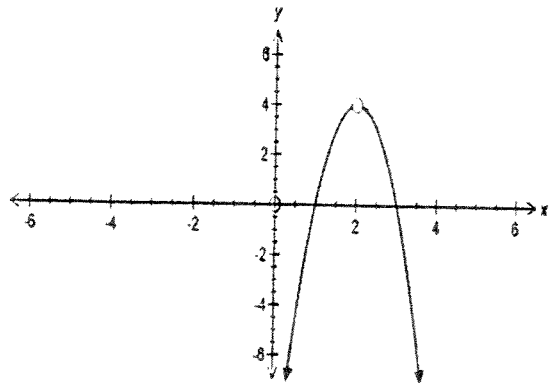
4) $f(2) =$



5) $f(30) =$

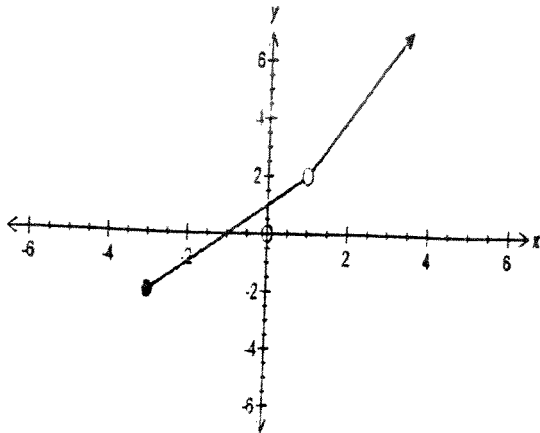


6) $f(3) =$



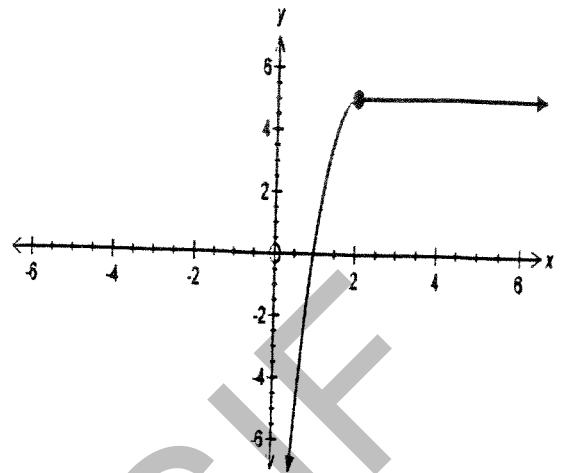
7)

$f(0) =$



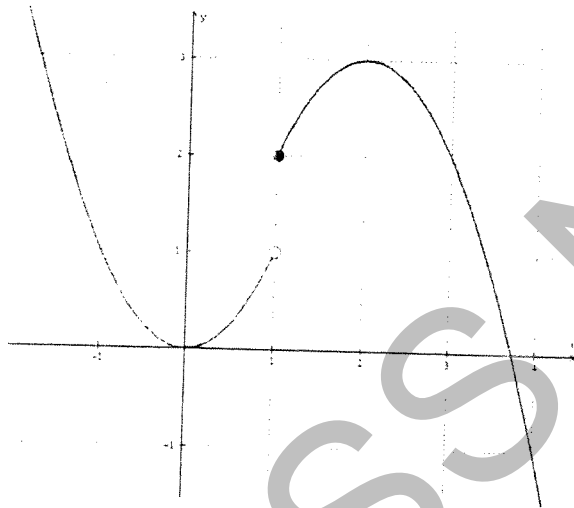
8)

$f(6) =$



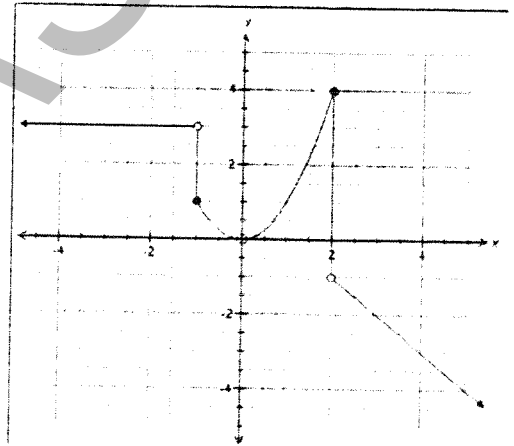
9)

$f(3) =$



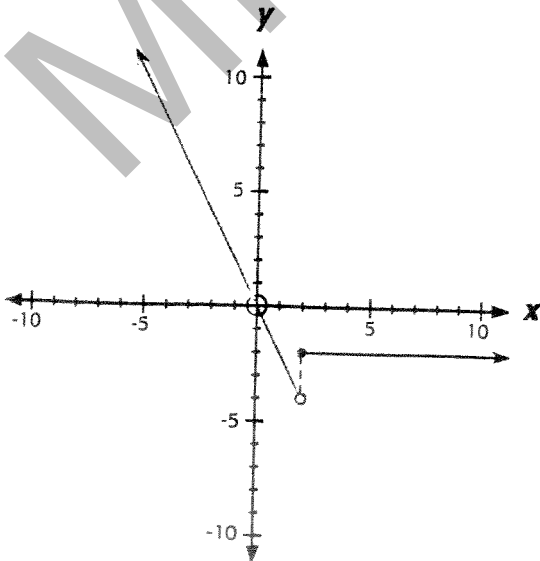
10)

$f(-4) =$



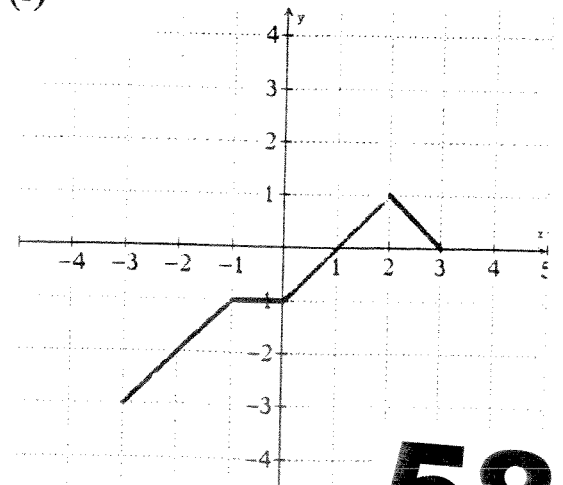
11)

$f(3) =$



12)

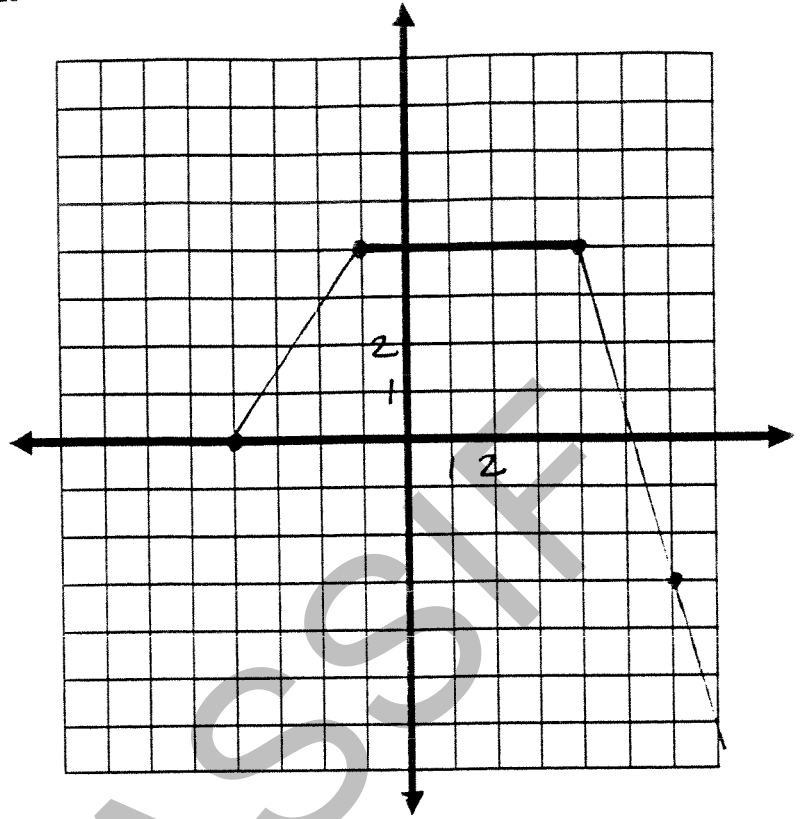
$f(1) =$



1

Find x value from a graph

$$f(x) = -1$$



2

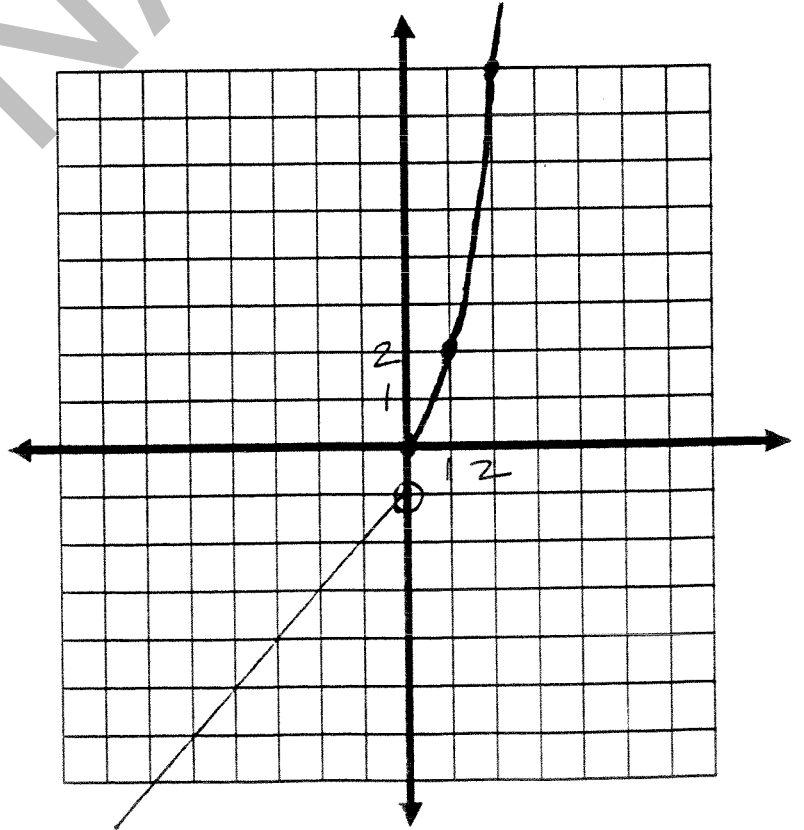
$$f(x) = 2$$

$$f(x) = 4$$

$$f(x) = 0$$

$$f(x) = -2$$

$$f(x) = -10$$



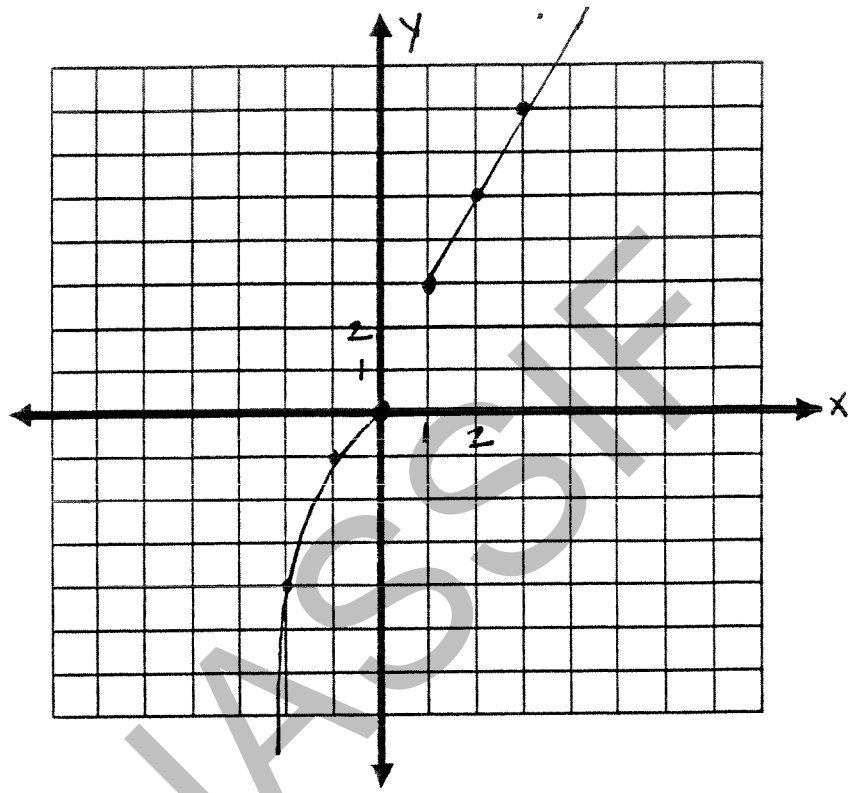
3

$$f(x) = 5$$

$$f(x) = -4$$

$$f(x) = 0$$

$$f(x) = 4$$



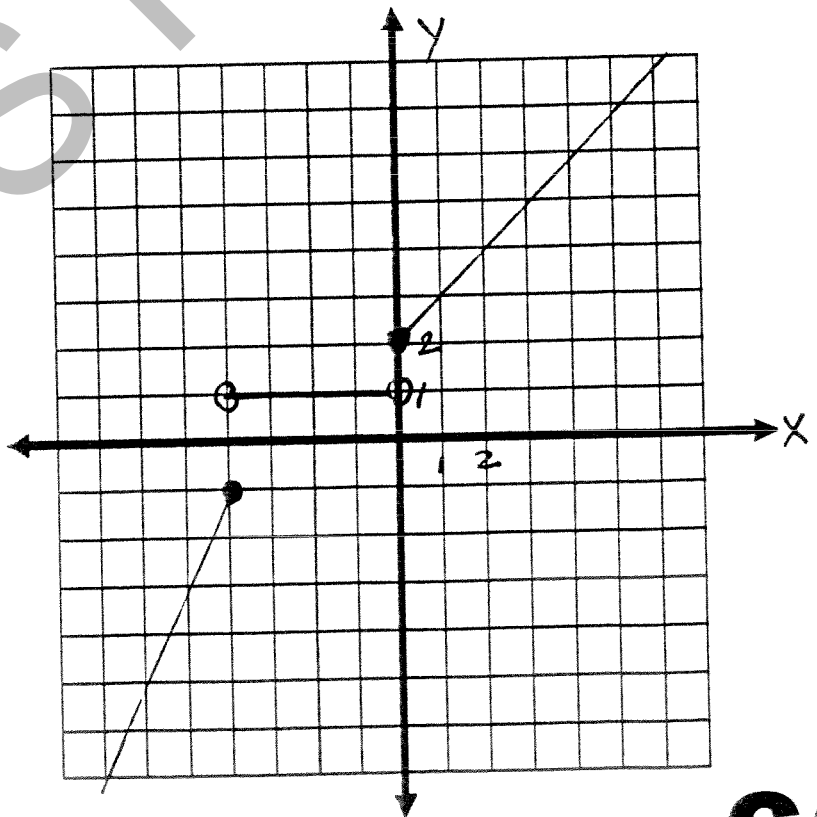
4

$$f(x) = 4$$

$$f(x) = -1$$

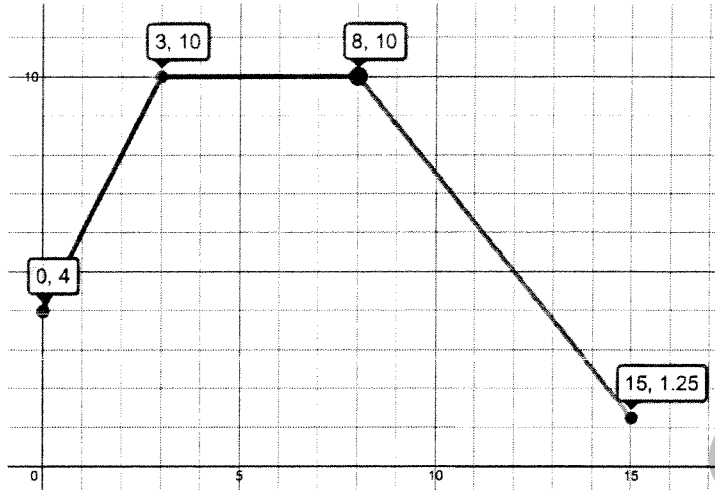
$$f(x) = -3$$

$$f(x) = -2$$



Functions - Piece-Wise

1. Describe the elements of the *piecewise* function shown below:



a) Use the coordinates in the graph to complete the rules for each of the 3 lines.

$$f(x) \left\{ \begin{array}{l} \underline{\hspace{1cm}}x + 4 \quad , \quad 0 \leq x \leq 3 \\ 10 \quad , \quad \underline{\hspace{1cm}} \leq x \leq \underline{\hspace{1cm}} \\ -1.25x + \underline{\hspace{1cm}} \quad , \quad \underline{\hspace{1cm}} \leq x \leq 15 \end{array} \right\}$$

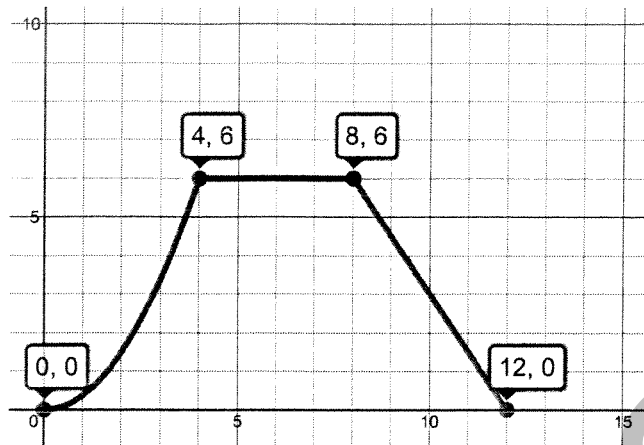
b) Using the above piecewise function, what is ...

$$f(5) = \underline{\hspace{2cm}} \quad (\text{i.e. what is 'y' when 'x' = 5})$$

$$f(6) = \underline{\hspace{2cm}} \quad (\text{i.e. what is 'y' when 'x' = 6})$$

$$f(14) = \underline{\hspace{2cm}} \quad (\text{i.e. what is 'y' when 'x' = 14})$$

2. Complete the information for the piecewise function shown below:



a) Use the coordinates in the graph to complete the rules for each of the 3 lines.

$$f(x) \left\{ \begin{array}{l} \underline{\hspace{2cm}} x^2, \quad 0 \leq x \leq \underline{\hspace{2cm}} \\ \underline{\hspace{2cm}}, \quad 4 \leq x \leq 8 \\ \underline{\hspace{2cm}} x + \underline{\hspace{2cm}}, \quad 8 \leq x \leq 12 \end{array} \right\}$$

b) Using the above piecewise function, what is $f(3)$? $f(3) = \underline{\hspace{2cm}}$
 (i.e. what is 'y' when 'x' = 3)

b) Using the above piecewise function, what is $f(6)$? $f(6) = \underline{\hspace{2cm}}$

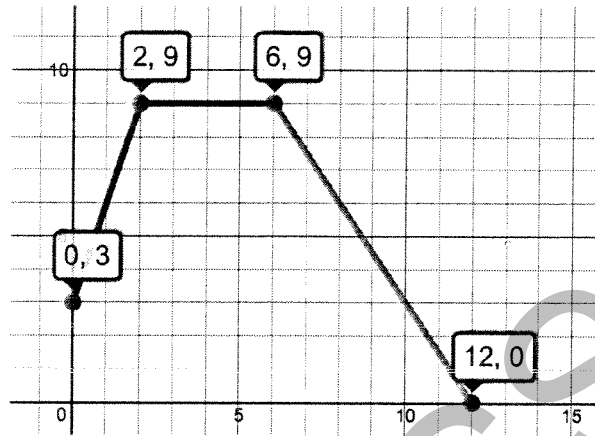
c) Using the above piecewise function, what is $f(10)$? $f(10) = \underline{\hspace{2cm}}$

d) dom f : $\underline{\hspace{4cm}}$

e) ran f : $\underline{\hspace{4cm}}$

Functions - Piece-Wise

1. Write the **rules** for each of the **3 functions** shown in the **piecewise** function shown below:

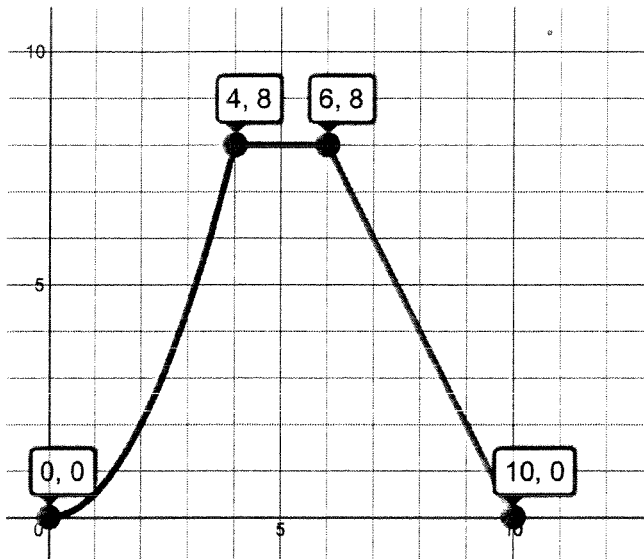


$$y = \left\{ \begin{array}{l} \underline{\hspace{2cm}}, 0 \leq x \leq 2 \\ \underline{\hspace{2cm}}, 2 \leq x \leq 6 \\ \underline{\hspace{2cm}}, 6 \leq x \leq 12 \end{array} \right\}$$

- a) Using the **above** piecewise function, what is y when

- $x = 1$, $y = \underline{\hspace{2cm}}$
- $x = 9$, $y = \underline{\hspace{2cm}}$

2. Write the **rules** for each of the **3 functions** shown in the **piecewise** function shown below:



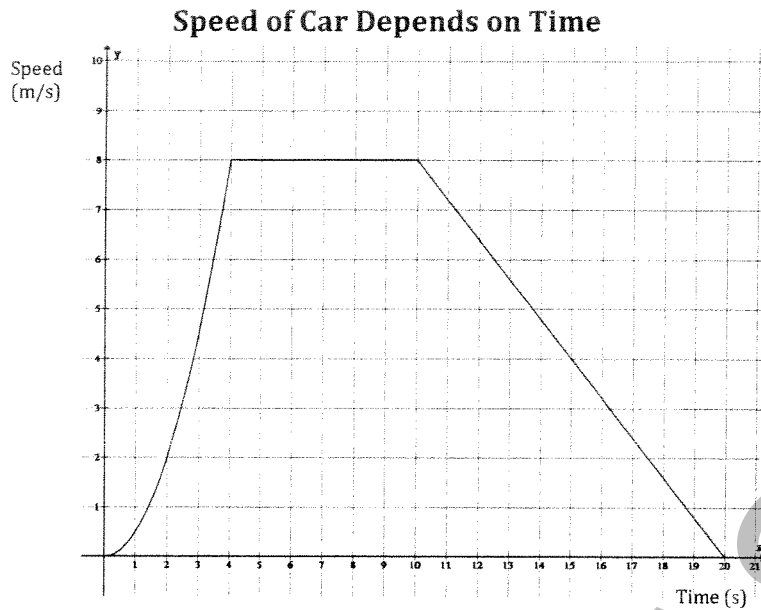
a)

$$y = \left\{ \begin{array}{l} \underline{\hspace{2cm}}, 0 \leq x \leq 4 \\ \underline{\hspace{2cm}}, 4 \leq x \leq 6 \\ \underline{\hspace{2cm}}, 6 \leq x \leq 10 \end{array} \right\}$$

b) Using the **above** piecewise function, what is y when

- $x = 3, y = \underline{\hspace{2cm}}$
- $x = 9, y = \underline{\hspace{2cm}}$

3. The graph below shows the speed of a car over time.



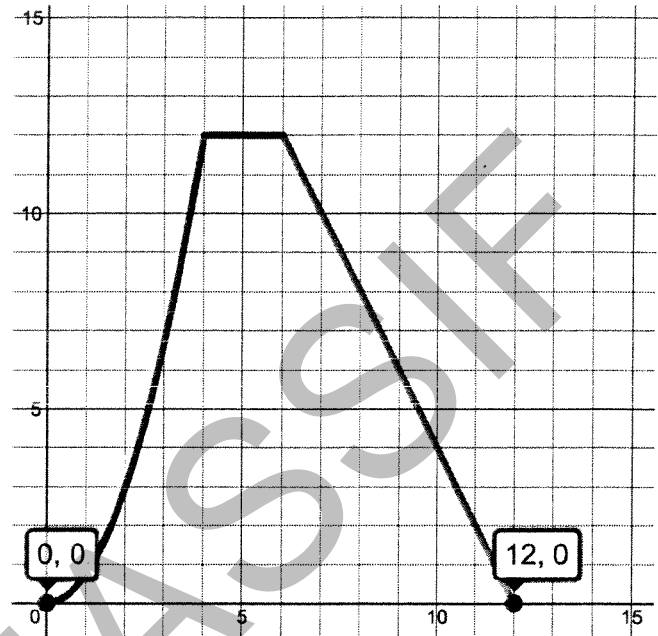
The function that describes the speed of the car over time is:

$$f(x) = \begin{cases} 0.5x^2 & \text{where } 0 \leq x \leq 4 \\ 8 & \text{where } 4 \leq x \leq 10 \\ -0.8x + 16 & \text{where } 10 \leq x \leq 20 \end{cases}$$

How much time passed between the two moments when the car had a speed of 4 m/s?

Functions - Piece-Wise

1. Write the **rules** for each of the **3 functions** shown in the **piecewise** function shown below:

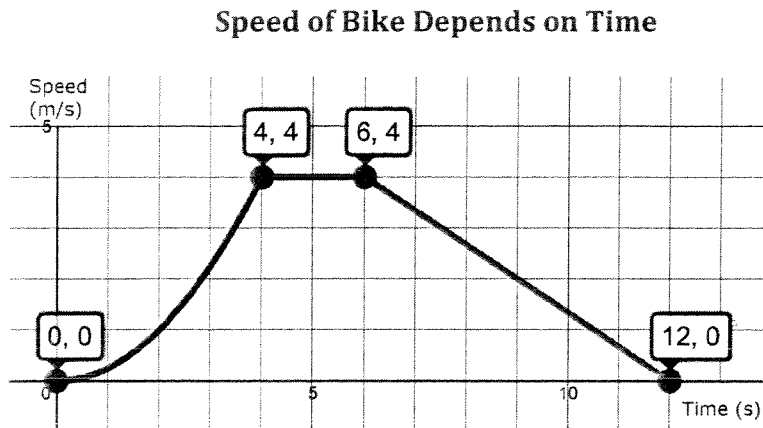


$$y = \left\{ \begin{array}{ll} \underline{\hspace{2cm}}, & 0 \leq x \leq 4 \\ 12, & 4 \leq x \leq 6 \\ \underline{\hspace{2cm}}, & 6 \leq x \leq 12 \end{array} \right\}$$

Using the **above** piecewise function, what is y when

- $x = 3$ $y = \underline{\hspace{2cm}}$
- $x = 11.2$ $y = \underline{\hspace{2cm}}$

2. The graph below shows the speed of a bike over time.



The function that describes the speed of the bike over time is:

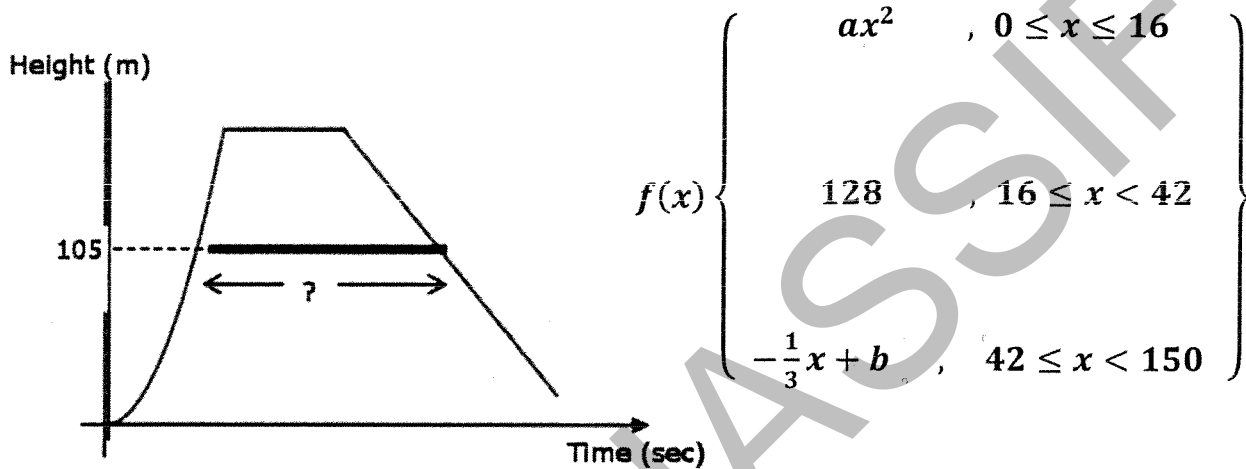
$$f(x) = \begin{cases} 0.25x^2 & \text{where } 0 \leq x \leq 4 \\ 4 & \text{where } 4 \leq x \leq 6 \\ -\frac{2}{3}x + 8 & \text{where } 6 \leq x \leq 12 \end{cases}$$

How much time passed between the two moments when the bike had a speed of 3 m/s?

3. An experimental rocket is fired from Macdonald High School.

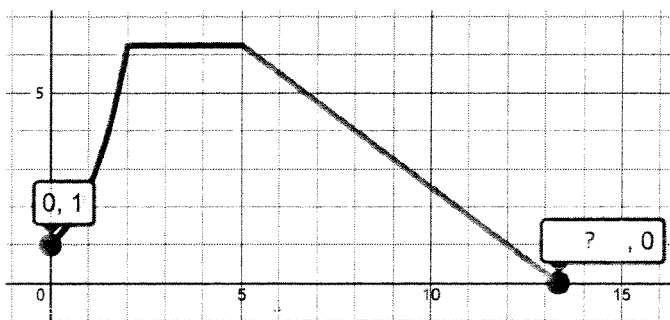
The graph of its height as a function of time is represented by the piecewise function below.

For how much time was the rocket at or above 105 m high?



Functions - Piece-Wise

1. Complete the **rules** for each of the **3 functions** shown in the **piecewise** function shown below:



a)

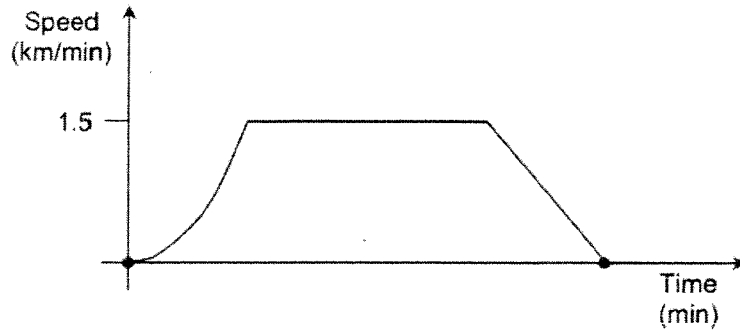
$$y = \left\{ \begin{array}{ll} a(2.5)^x, & 0 \leq x \leq 2 \\ \text{---} & 2 \leq x \leq 5 \\ -0.75x + \text{---}, & 5 \leq x \leq \text{---} \end{array} \right\}$$

- b) Using the **above** piecewise function, what is y when

- $x = 3, \quad y = \text{---}$
- $x = 9, \quad y = \text{---}$

2. A car set off, accelerated and then travelled at a speed of 1.5 km/min for a few minutes. It then slowed down before coming to a complete stop.

SPEED OF THE CAR ACCORDING TO THE TIME ELAPSED FROM THE MOMENT IT SET OFF



Function f described below represents the speed of the car according to the time elapsed from the moment it set off.

$$y = \begin{cases} 0.06x^2 & , \quad 0 \leq x \leq 5 \\ 1.5 & , \quad 5 \leq x \leq 15 \\ -0.3x + 6 & , \quad 15 \leq x \leq 20 \end{cases}$$

x : time since the car set off

y : speed of the car (km/min)

How much **time passed** between the **two moments** when the car was travelling at a speed of **0.96 km/min**?

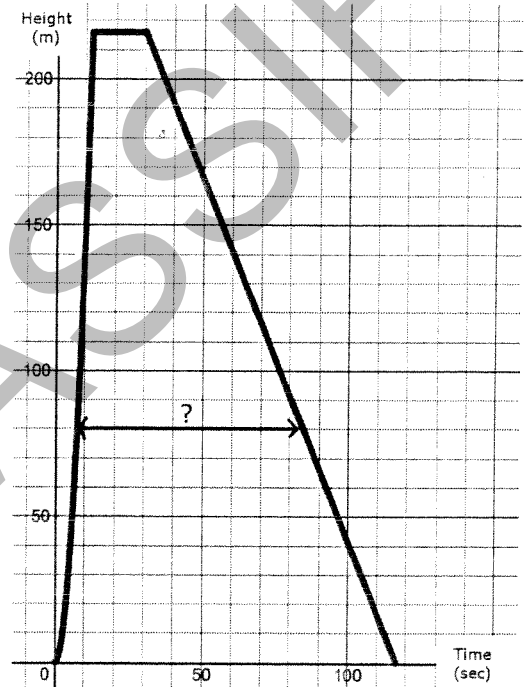
- A. 4 minutes
- B. 12 minutes
- C. 12.8 minutes
- D. 16.8 minutes

3. A guinea pig is fired into the air on a rocket, and falls back to the ground with a parachute.

The guinea pig's height as a function of time is represented by the piecewise function below.

For how much long was the adorable little guy at or above 80 m?

$$f(x) \begin{cases} ax^2 & , \quad 0 \leq x \leq 12 \\ 216 & , \quad 12 \leq x \leq 30 \\ -2.5x + 291 & , \quad 30 \leq x \leq 116.4 \end{cases}$$



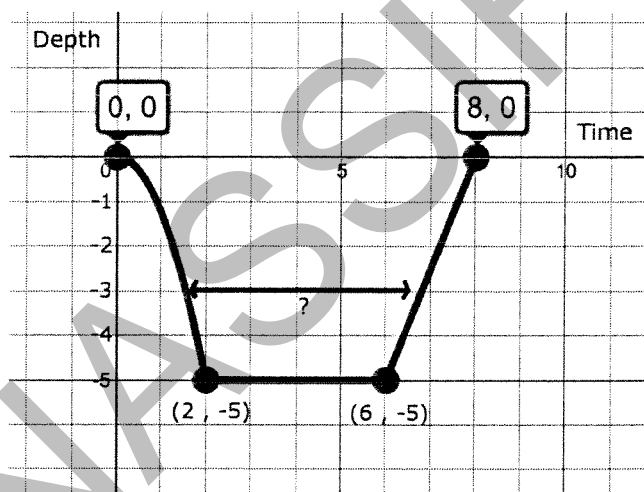
Functions - Piece-Wise

1. Lifeguard certification requires a lifeguard to swim underwater and stay **below 3 m** of depth for **at least 5.5 seconds**.

Megan's underwater swim is described below.

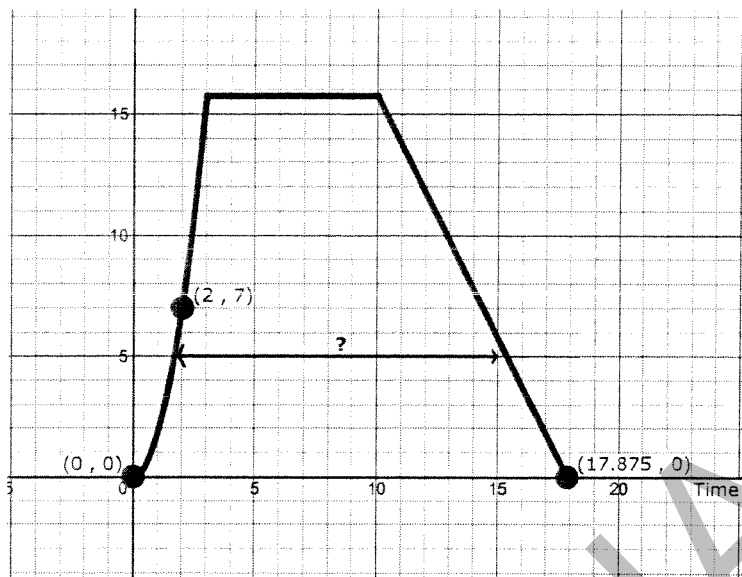
Did Megan get her lifeguarding certification? Justify your answer.

$$y = \begin{cases} ax^2, & 0 \leq x \leq 2 \\ \text{---}, & 2 \leq x \leq 6 \\ ax + b, & 6 \leq x \leq 8 \end{cases}$$



Answer: Megan _____ her certification.
She spent _____ seconds under water.

2. Steven is trying out for the Patriots and must run the length of a football field. The speed of his run is described by the piece-wise function shown below. For how many seconds did Steven maintain a speed greater than or equal to 5 m/s?



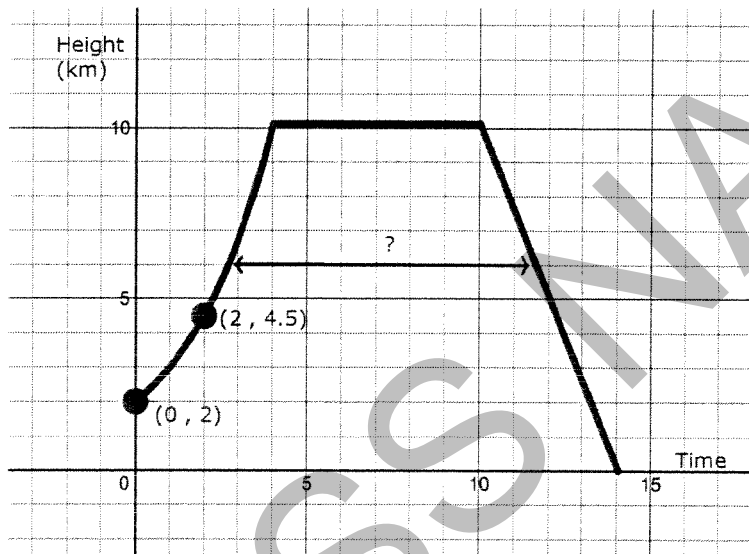
$$y = \left\{ \begin{array}{ll} ax^2 & , \quad 0 \leq x \leq 3 \\ \text{---} & , \quad 3 \leq x \leq 10 \\ ax + b & , \quad 10 \leq x \leq 17.875 \end{array} \right\}$$

Answer: Steven stayed at or above 5.5 m/s for _____ sec

3. Milan ties a squirrel to a rocket and tries to send him into outer space.
The path the squirrel takes is described in the piece-wise function below.

- What is the maximum height (in km) the squirrel reaches.
- How much time will the squirrel have spent at or above 6 km of altitude?

$$f(x) \begin{cases} a(1.5)^x & , \quad 0 \leq x \leq 4 \\ \text{---} & , \quad 4 \leq x \leq 10 \\ -2.5x + \text{---} & , \quad 10 \leq x \leq \text{---} \end{cases}$$



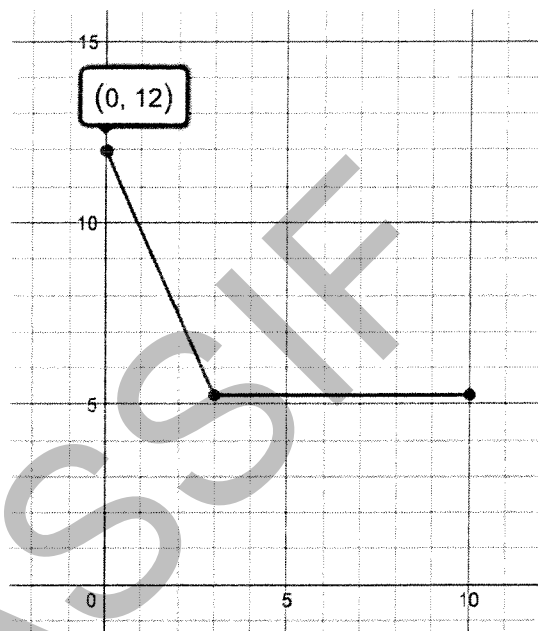
Answer: The squirrel reaches a max height of _____ km
It will have spent _____ minutes at or above 6 km.

Functions - Piece-Wise

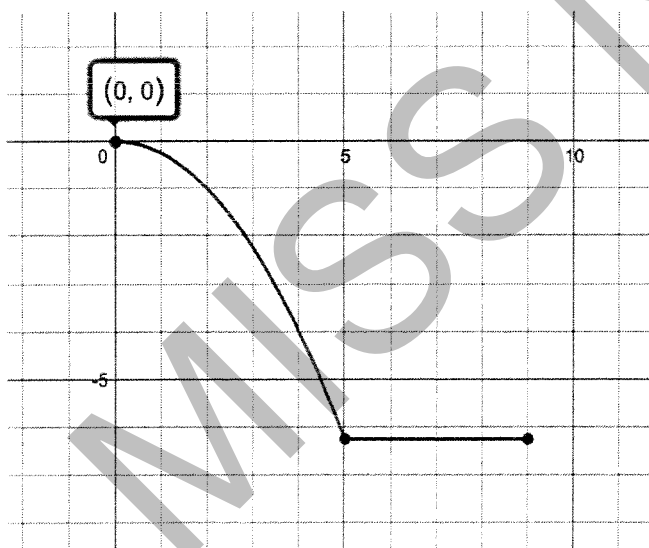
- Practice Quiz

1. Fill in the missing parts to the piecewise function.

$$y = \left\{ \begin{array}{l} -2.25x + \underline{\hspace{2cm}}, 0 \leq x \leq 3 \\ \underline{\hspace{2cm}}, 3 \leq x \leq 10 \end{array} \right\}$$



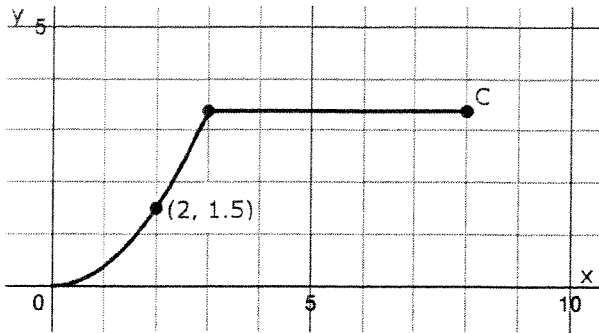
2. Fill in the missing pieces to the piecewise function



$$y = \left\{ \begin{array}{l} \underline{\hspace{2cm}}x^2, 0 \leq x \leq 5 \\ -6.25, 5 \leq x \leq 9 \end{array} \right\}$$

b) If $x = 3$, $y = \underline{\hspace{2cm}}$

3. Find the coordinates of point C

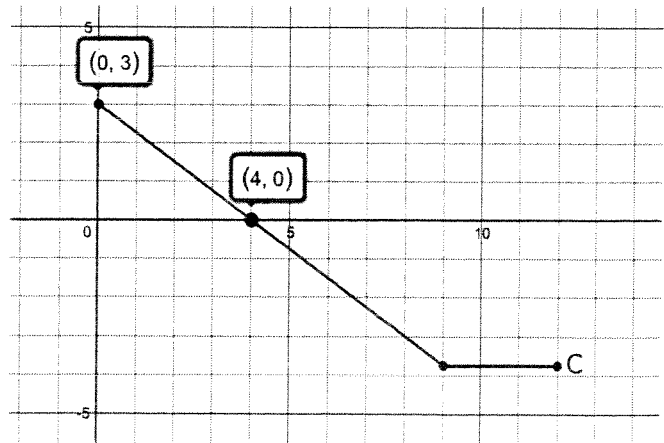


$$y = \left\{ \begin{array}{l} ax^2, \quad 0 \leq x \leq 3 \\ \underline{\hspace{2cm}}, \quad 3 \leq x \leq 8 \end{array} \right\}$$

C (_____ , _____)

4. Find the coordinates of point C

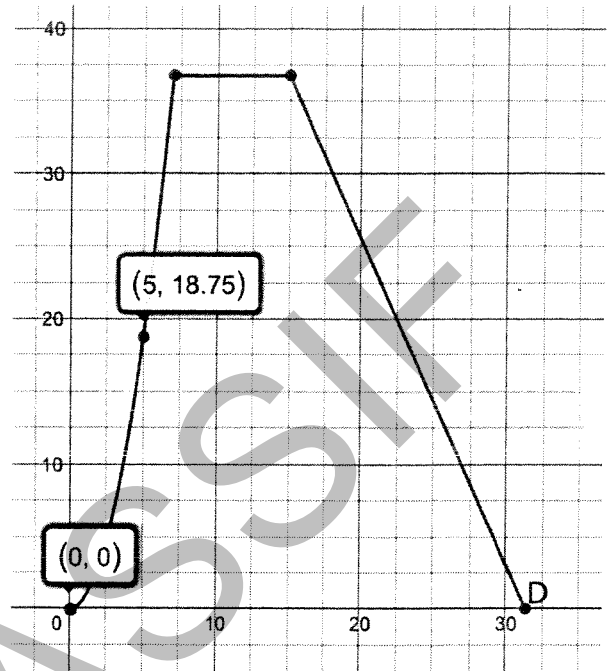
$$y = \left\{ \begin{array}{l} \underline{\hspace{1cm}}x + \underline{\hspace{1cm}}, \quad 0 \leq x \leq 9 \\ \underline{\hspace{2cm}}, \quad 9 \leq x \leq 12 \end{array} \right\}$$



C (_____ , _____) .

5. Find the coordinates of point D.

$$y = \begin{cases} 0.75x^2, & 0 \leq x \leq 7 \\ \text{_____}, & 7 \leq x \leq 15 \\ -2.25x + b, & 15 \leq x \leq \text{_____} \end{cases}$$



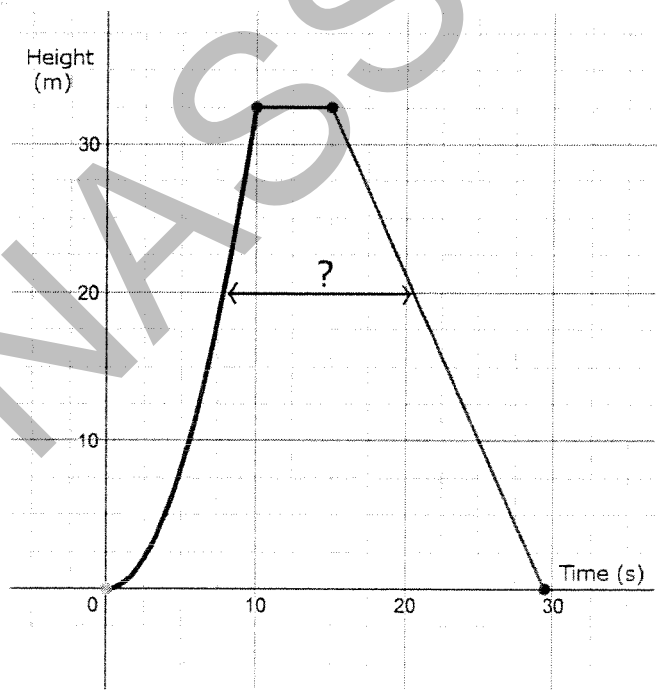
D (_____ , _____) .

6. Hayden builds a rocket for Science Fair and tries to send a kitten into outer space. The rocket's flight is described by the piecewise function below.

How much time did the rocket spend at or above 20 m in height?

(Round your answer to the nearest tenth)

$$y = \left\{ \begin{array}{ll} \frac{1}{2}x^2 & , 0 \leq x \leq 10 \\ 32.5 & , 10 \leq x \leq 15 \\ -2.25x + 66.25 & , 15 \leq x \leq 29.44 \end{array} \right\}$$



The rocket spent _____ seconds at or above 20 m.

MISS NAASSIF

June Exam Practice Questions

Functions

1. CELL PHONES

Several months ago, Sarah and Zoe each bought a cell phone on the same day. Since then, the value of each woman's cell phone has decreased.

SARAH'S CELL PHONE

Function f described below represents the value of Sarah's cell phone.

$$f(x) = 300(0.97)^x$$

where x : time elapsed, in months, since Sarah bought her cell phone
 $f(x)$: value of Sarah's cell phone, in dollars

Today, to the nearest cent, Sarah's cell phone is worth \$257.62.

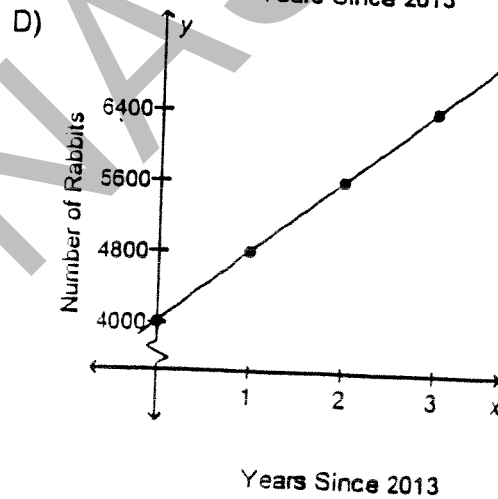
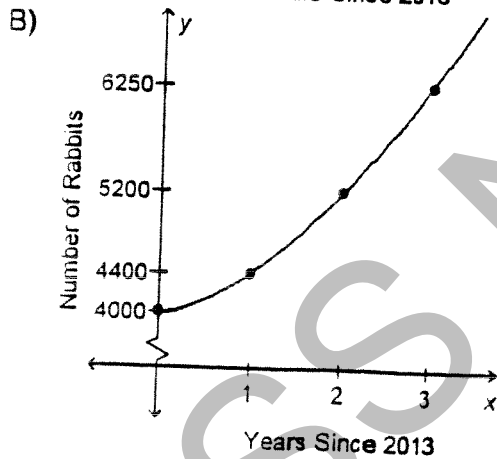
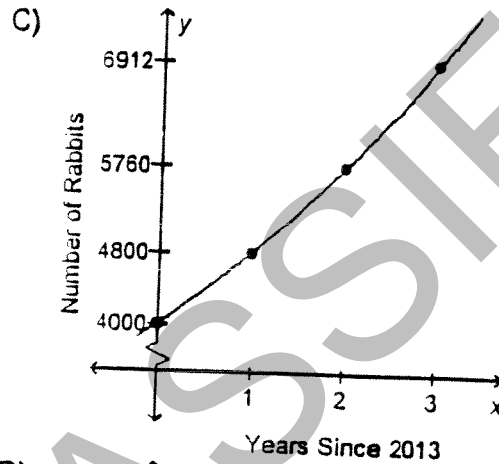
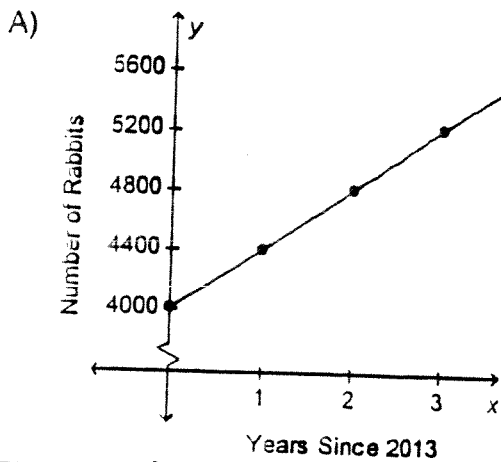
ZOE'S CELL PHONE

Zoe's cell phone was worth \$240 on the day she bought it.

Each month since then, her cell phone has lost 4% of its value in relation to the previous month.

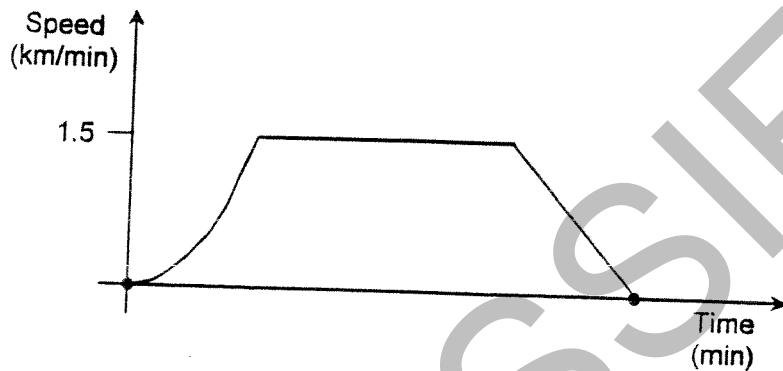
From the day they were purchased, which of the two cell phones has lost the most value, in dollars?

2. In 2013, the wild rabbit population of the Gatineau Park was 4000 rabbits. It is estimated that each year the population will increase by 20% relative to the previous year. The function that represents this situation is $y = 4000(1.2)^x$ where the number of years is x and the number of rabbits is y . Which graph below accurately represents the rabbit population from 2013 to 2016?



5. A car set off, accelerated and then travelled at a speed of 1.5 km/min for a few minutes. It then slowed down before coming to a complete stop.

SPEED OF THE CAR ACCORDING TO THE TIME ELAPSED FROM THE MOMENT IT SET OFF



Function f described below represents the speed of the car according to the time elapsed from the moment it set off.

$$f(x) = \begin{cases} 0.06x^2 & \text{if } 0 \leq x \leq 5 \\ 1.5 & \text{if } 5 \leq x \leq 15 \\ -0.3x + 6 & \text{if } 15 \leq x \leq 20 \end{cases}$$

where x : time elapsed, in minutes, from the moment the car set off
 $f(x)$: speed of the car in km/min

How much time elapsed between the two moments when the car was travelling at a speed of 0.96 km/min?

- A) 4 minutes
 B) 12 minutes
 C) 12.8 minutes
 D) 16.8 minutes

7 WELL WATER

Jim bought a cottage a few years ago.

Since then Jim has been analyzing the water in the well at his cottage every year on June 1.

Data collected over past years was used to establish that function f described below represents the number of atypical bacteria in the well water in relation to the amount of time elapsed since Jim bought the cottage.

$$f(x) = 16(1.5)^x$$

where x : number of years elapsed since Jim bought the cottage

$f(x)$: number of atypical bacteria per 100 mL of water

In 2012, the analysis revealed that the well water contained 54 atypical bacteria per 100 mL.

In what year will the analysis reveal for the first time that there are more than 200 atypical bacteria per 100 mL of water?

9

MOVING TRUCKS

Lucas and Martin each rented a moving truck for several hours. In addition to the cost of renting the truck, they also had to pay for insurance.

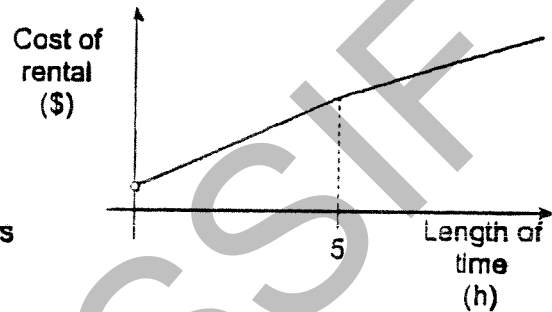
RENTAL COST

Function f described below is used to determine the cost of renting a truck according to the length of time the truck is rented for.

$$f(x) = \begin{cases} 30x + 45 & \text{if } 0 < x \leq 5 \\ 20x + 95 & \text{if } x \geq 5 \end{cases}$$

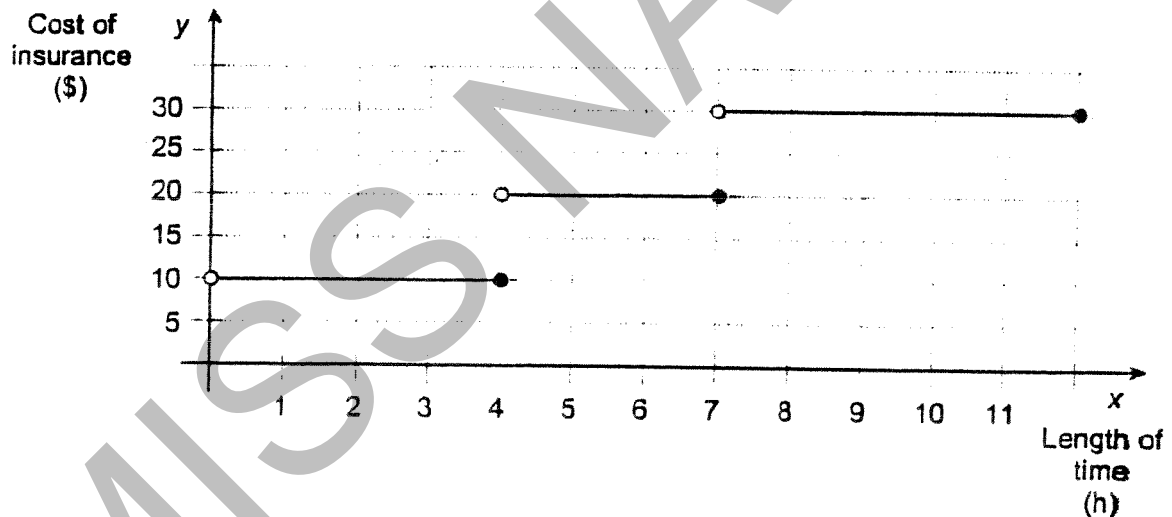
where x : length of time the truck is rented for, in hours

$f(x)$: cost of renting the truck, in dollars



COST OF INSURANCE

The function represented in the Cartesian plane below is used to determine the cost of insurance according to the length of time the truck is rented for.



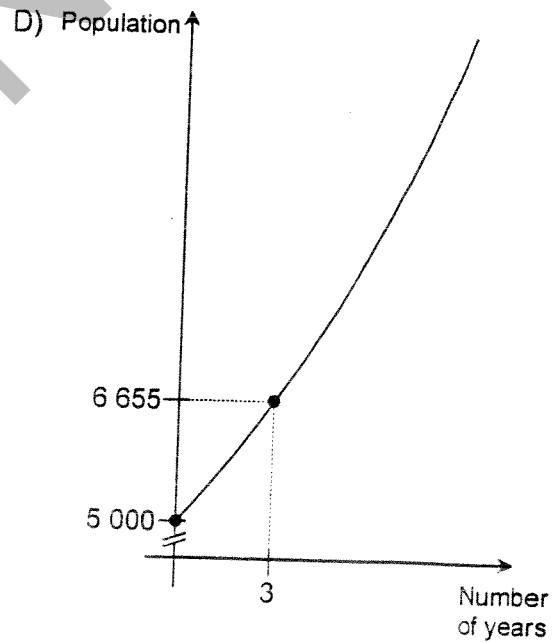
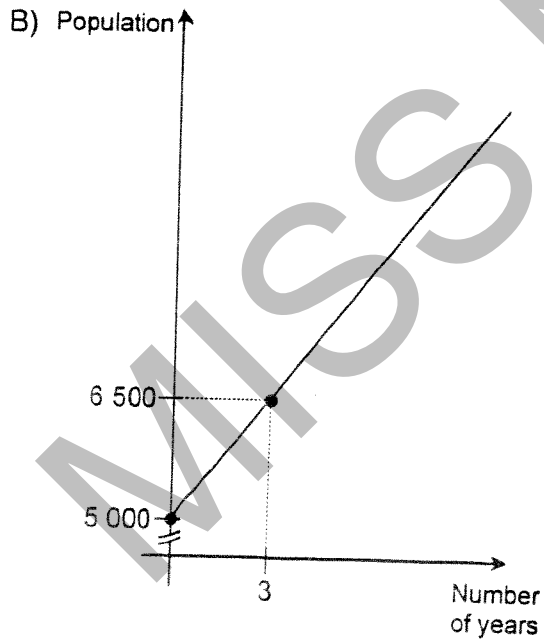
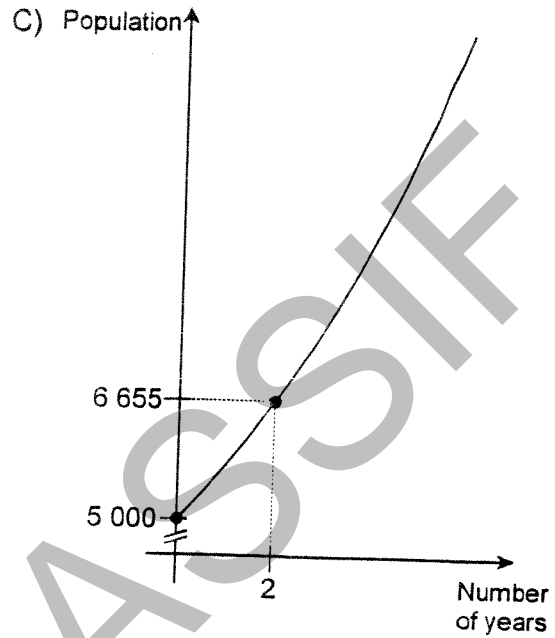
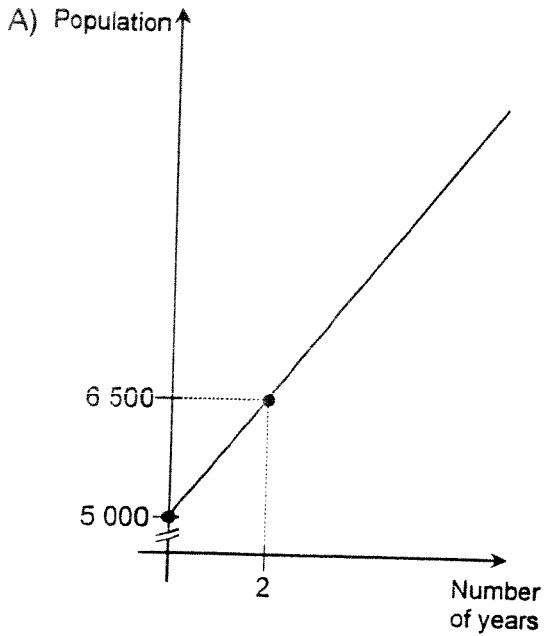
- The cost of insurance for the truck Lucas rented is the same as the cost of insurance for the truck Martin rented.
- The rental cost that Martin paid for his truck was \$180.

What is the maximum rental cost that Lucas could have paid for his truck?

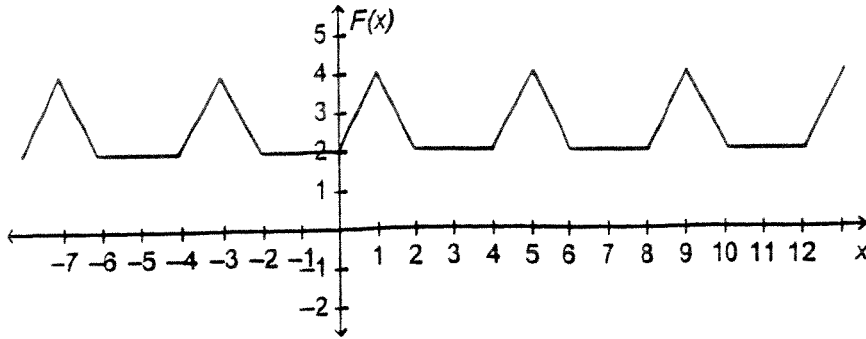
10.

In 2011, a town had a population of 5 000. It is estimated that each year, the population will increase by 10% relative to the previous year.

Which graph below represents the population this town will have in relation to the number of years elapsed since 2011?



11. Given the periodic function illustrated in the graph below, determine the value of $f(25)$.



- A) $f(25) = 4$ B) $f(25) = 2$ C) $f(25) = 3$ D) $f(25) = 3.5$

12. Macrohard Software and Computers Inc. has been manufacturing processors since 1982. They estimate that the speed of their top processor has increased by 15% every year. On January 1, 1982, the speed of their top processor was 60 MHz. This situation is represented by the rule given below:

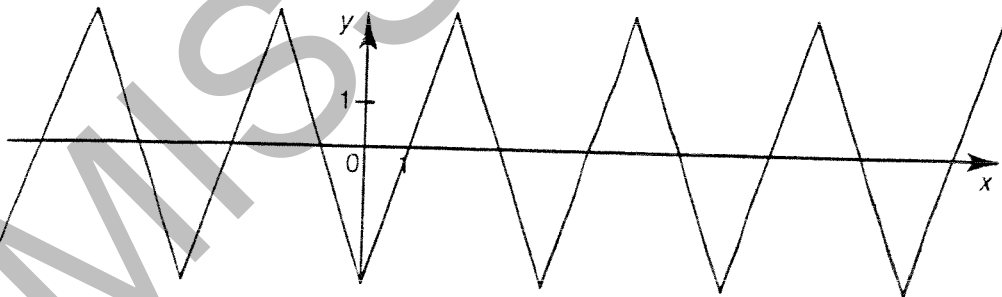
$$F(x) = 60(1.15)^x$$

x : # of years since January 1, 1982

$F(x)$: Speed of the top processor

What will the speed of the company's top processor be on January 1, 2012?

13. The following graph represents a periodic function f .



What is the period of this function?

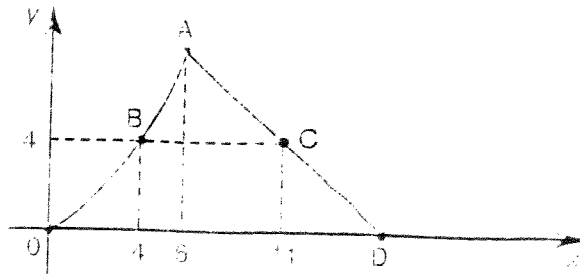
- A) $\frac{1}{4}$ B) 2 C) 20 D) 4

14. A quadratic function f , given by the rule $y = ax^2$, passes through the point $P(4, -24)$.

Determine the value of x for $y = -6$.

15.

The following figure consists of part of a parabola, with a vertex at $O(0, 0)$, and the line segment AD .



Point A, located on the parabola, has an x -coordinate of 6.

Point B, located on the parabola, is given by the coordinates $B(4, 4)$.

Point C, located on segment AD , is given by the coordinates $C(11, 4)$.

Point D is located on the x -axis.

To the nearest tenth, what is the length of segment AD ?

The length of segment AD , to the nearest tenth, is:

16.

A pebble is dropped into a well.

The table of values on the right illustrates the quadratic function, which gives the distance travelled by the pebble (in m) as a function of the drop time (in seconds).

Determine the drop time if the well has a depth of 180 m.

Drop time (sec)	Distance travelled (m)
0	0
1	5
2	20

The duration of the pebble's fall is: _____

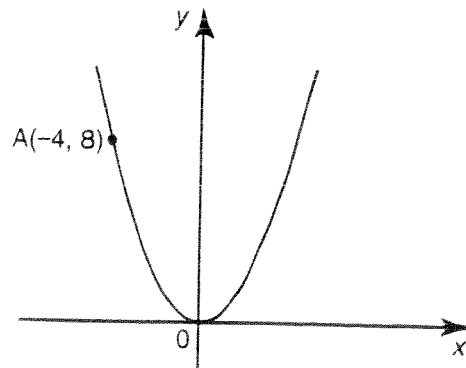
17.

The parabola on the right is defined by the equation $y = ax^2$ and passes through the point $A(-4, 8)$.

Point B on this parabola has an x -coordinate of 6.

What is the y -coordinate of point B?

- A) 36
- B) 18
- C) 72
- D) 12

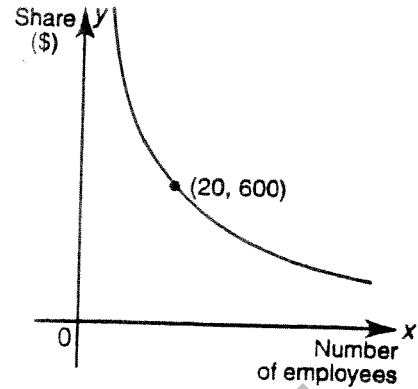


18

An amount of money is equally divided among the employees of a company.

The function f represented on the right relates each employee's share y (in \$) as a function of the number x of employees.

Given that $f(20) = 600$, determine the rule of this function.



The rule of function f is: _____

19

The graph on the right represents the hourly growth of a bacterial culture.

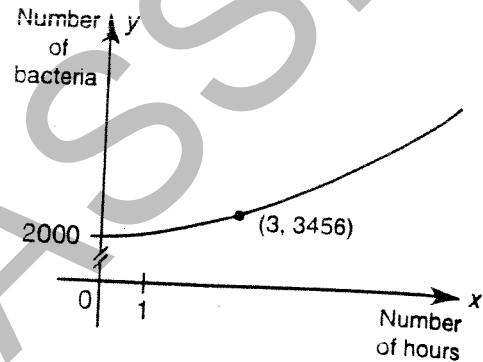
Which one of the following rules could represent this growth?

A) $y = \frac{1456}{3}x + 2000$

C) $y = 2000(1.2)^x$

B) $y = 2000(0.8)^x$

D) $y = 2000$



21. Vanessa filled her car's gas tank before going on a trip. The function which associates the distance traveled, in kilometers, to the quantity of gas, in litres, left in her gas tank is a linear function.

After traveling a distance of 100 km, there remains 60 litres of gas in her tank, and after traveling 250 km, there remains 42 litres.

After how many kilometers will the gas tank in Vanessa's car be empty?

22.

The organizing committee for a high school prom decides to hold a talent show to raise money so they can subsidize the cost of the prom.

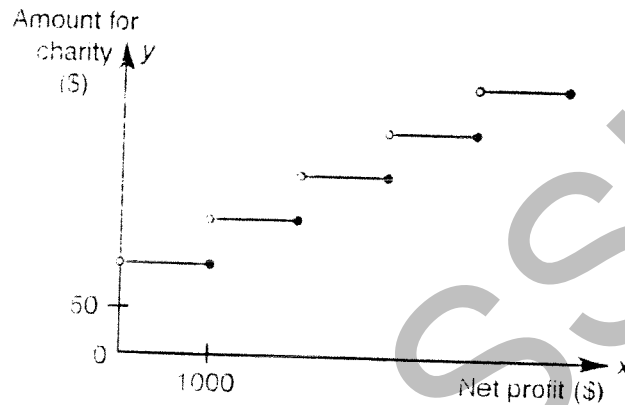
The function that associates the net profit as a function of the number of people attending the show is a linear function.

If there are 200 people in attendance, the net profit will be \$2200.

If there are 300 people in attendance, the net profit will be \$3700.

The organizing committee wants to donate part of the net profit to charity.

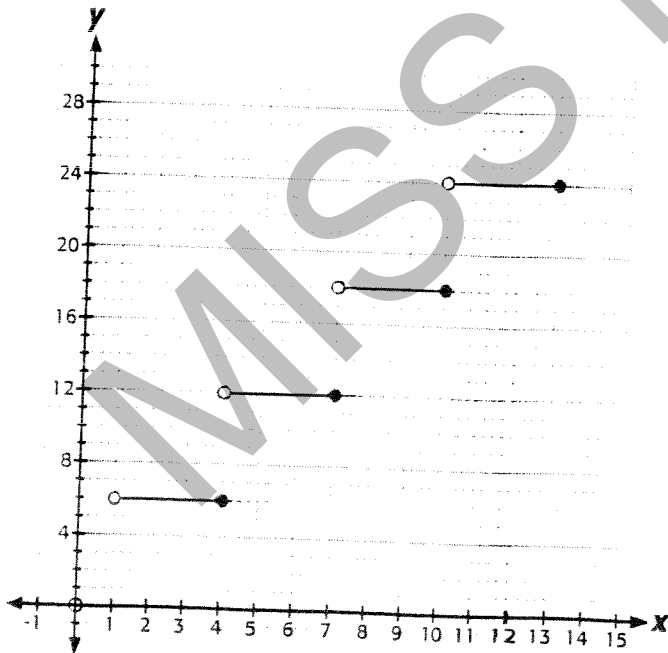
The following greatest integer function shows the amount given to charity as a function of the amount of net profit.



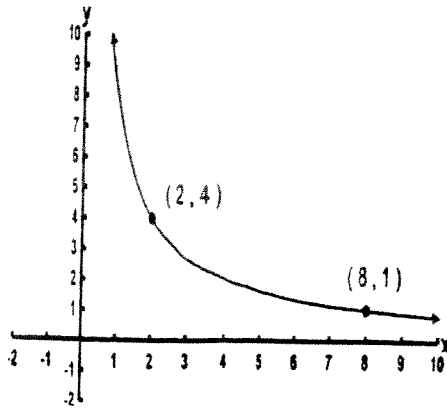
How much will be given to charity if 270 people attend the talent show?

23.

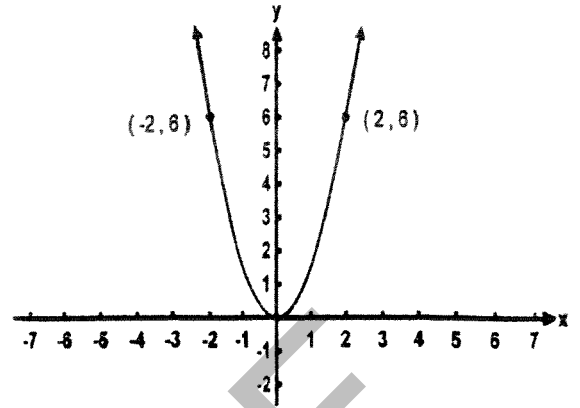
Given the following step function, determine the values for which $f(x) = 12$.



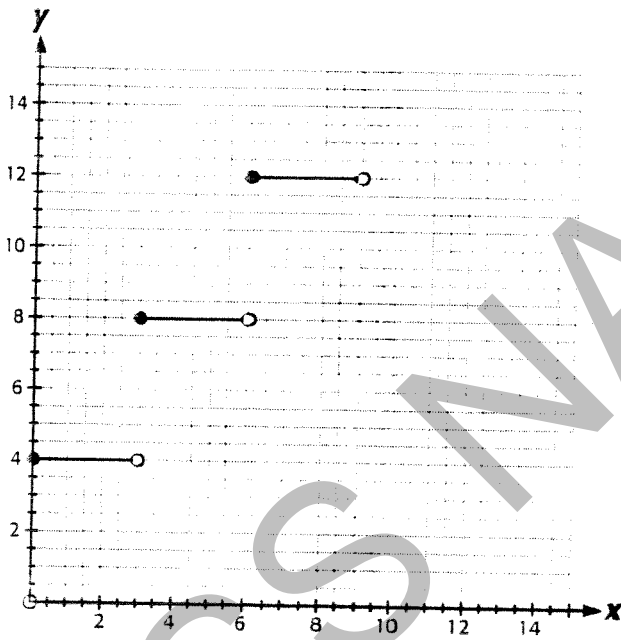
24. Given the graph of a rational function below, find the rule of this function.



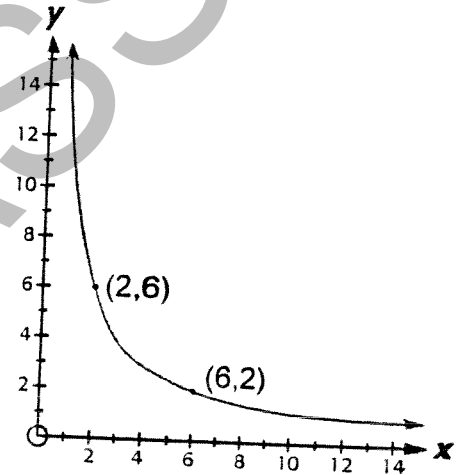
25. Find the rule of the quadratic function, given the graph below.



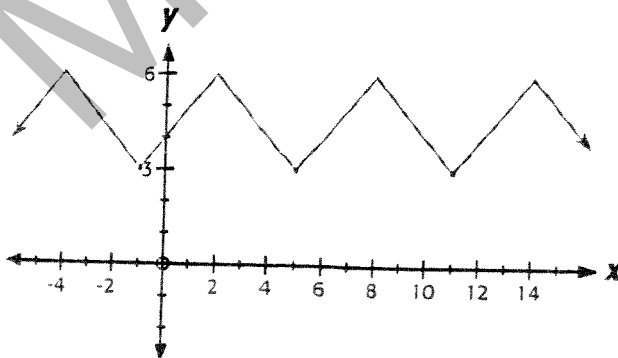
26. Evaluate $f(3)$ in the following function:



27. Given the graph of a rational function below, find the rule of this function.



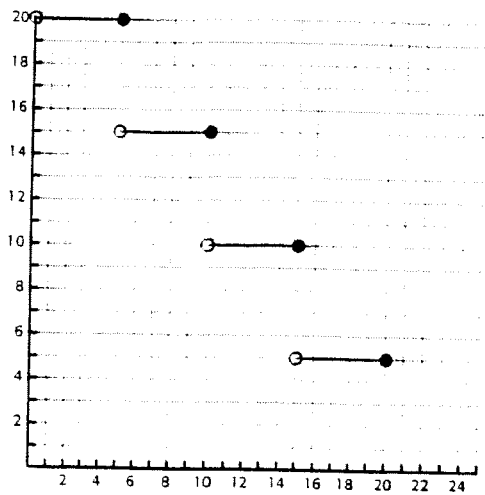
28. State the frequency of the periodic function illustrated below.



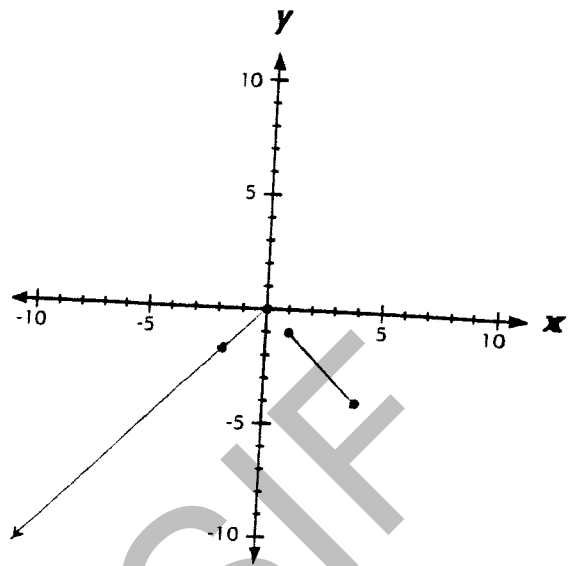
29. Given the information below, find the rule that describes the results in the table of values.

x	3	6	12	15
y	20	10	5	4

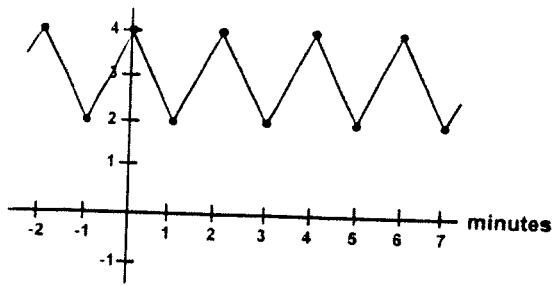
30. Evaluate this function at $x = 14$



31. Find $f(-9)$



32. Given the periodic function illustrated below, determine the value of $f(-9)$.



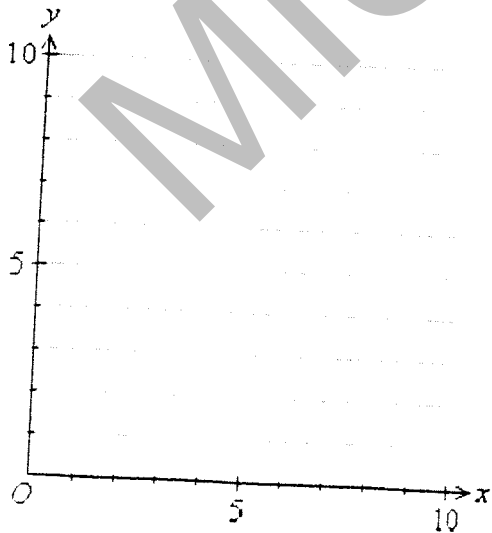
33. Find the value of $f(-3)$

$$f(x) = \begin{cases} x-1 & \text{if } x < 2 \\ (x-3)^2 & \text{if } 2 \leq x < 4 \\ x-3 & \text{if } x > 4 \end{cases}$$

34. Sketch the graph of the following situation for the first 3 hours.

Pricing Guide:

- First hour or part of an hour: \$5
- Every additional hour or part of an hour: \$3

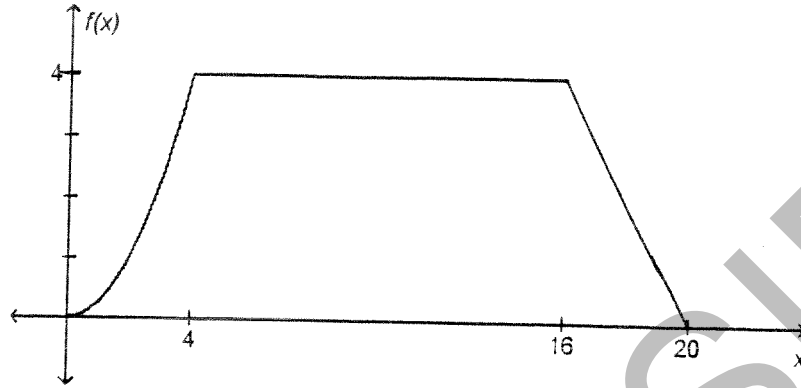


35.

The share value of a company's stock price is represented in the graph below by the piecewise function

$$f(x) = \begin{cases} 0.25x^2 & \text{if } 0 \leq x \leq 4 \\ 4 & \text{if } 4 < x \leq 16 \\ 20 - x & \text{if } 16 < x \leq 20 \end{cases}$$

x : number of days
 $f(x)$: company's stock price

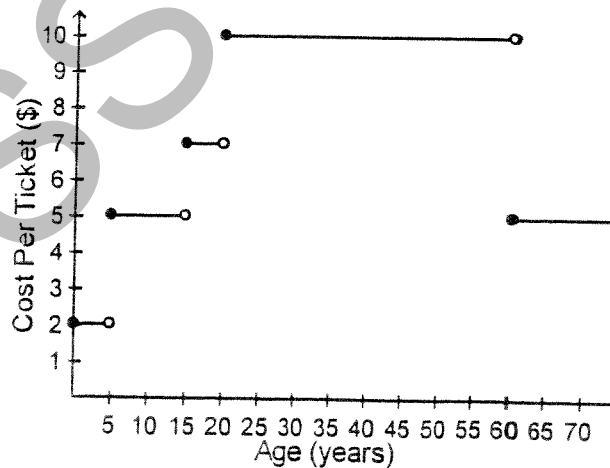


For how many days was the stock price at least \$1?

- a) 17 days
- b) 20 days
- c) 3 days
- d) 18 days

36.

The following graph shows the ticket prices according to a person's age for a movie theater.



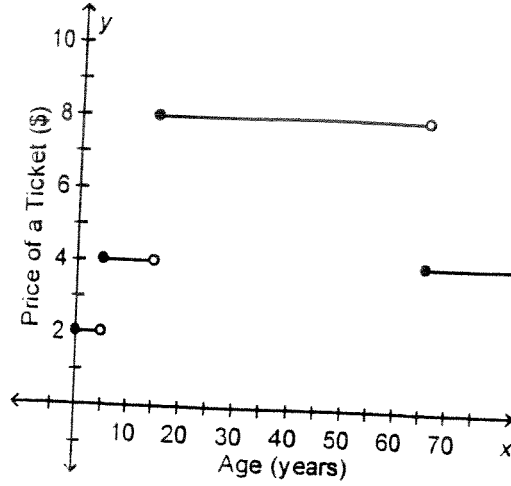
Jasmine is 15 years old and is going to the movies this Friday with her 5 year old brother, her 40 year old mother, and her 60 year old grandmother.

What is the total cost of the four of them going to the movies?

- a) \$22
- b) \$29
- c) \$27
- d) \$25

37.

The graph below shows that different age groups pay different ticket prices to attend a junior hockey game.



Which of the following statements is true?

- a) A 15-year old pays \$4 and a 16-year old pays \$8.
- b) A 5-year old pays \$2 and a 15-year old pays \$8.
- c) A 5-year old and a 65-year old both pay \$4.
- d) A 5-year old pays \$2 and a 65-year old pays \$8.

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NAME: _____

June Questions Practice

Answer Sheet

Work elsewhere.

- | | | | | | |
|------------|-------------|------------|-------------|------------|-------------|
| 1. | _____ | 14. | _____ | 27. | _____ |
| 2. | _____ | 15. | skip | 28. | _____ |
| 3. | _____ | 16. | _____ | 29. | _____ |
| 4. | _____ | 17. | _____ | 30. | _____ |
| 5. | skip | 18. | _____ | 31. | _____ |
| 6. | skip | 19. | _____ | 32. | _____ |
| 7. | _____ | 20. | skip | 33. | _____ |
| 8. | skip | 21. | _____ | 34. | _____ |
| 9. | skip | 22. | _____ | 35. | Skip |
| 10. | _____ | 23. | _____ | 36. | _____ |
| 11. | _____ | 24. | _____ | 37. | _____ |
| 12. | _____ | 25. | _____ | | |
| 13. | _____ | 26. | _____ | | |

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