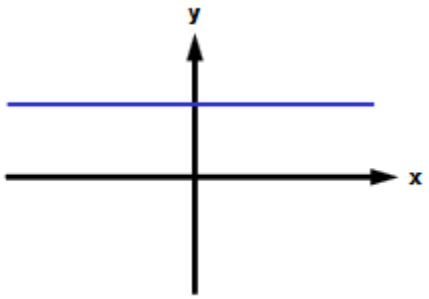
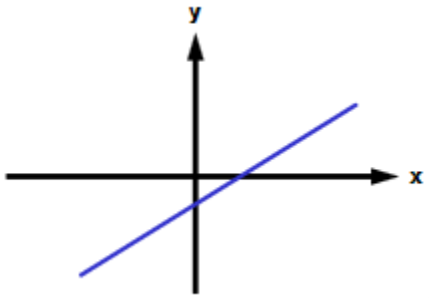
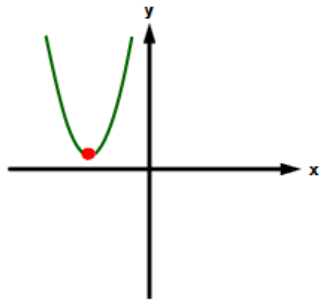
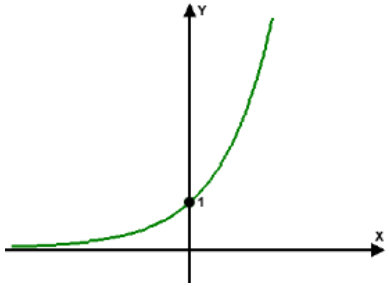


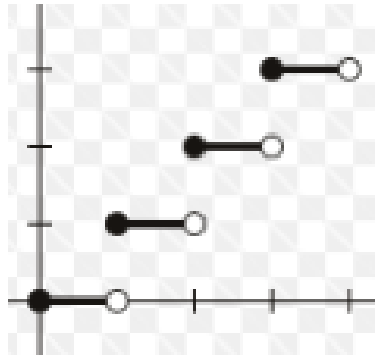


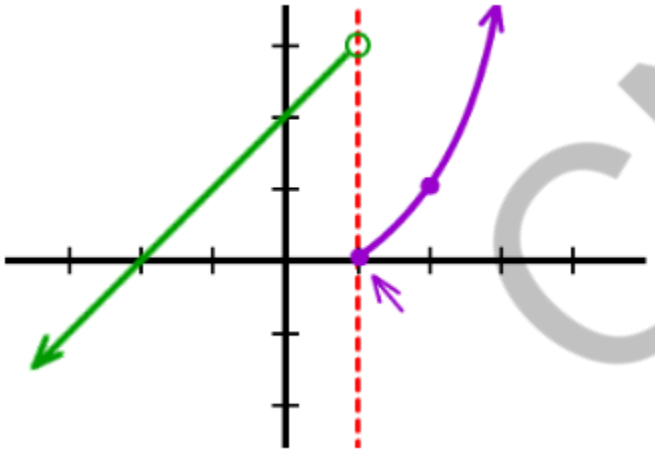


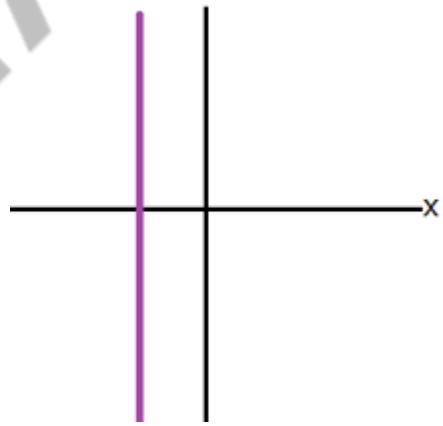
Chapter 4:

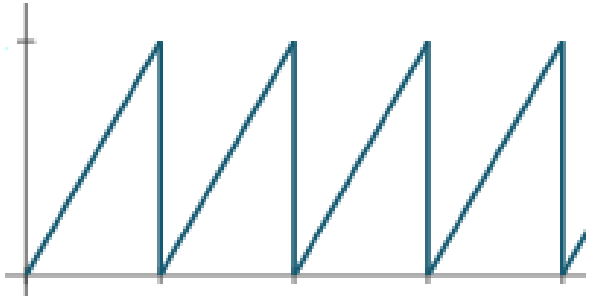
Types of Functions



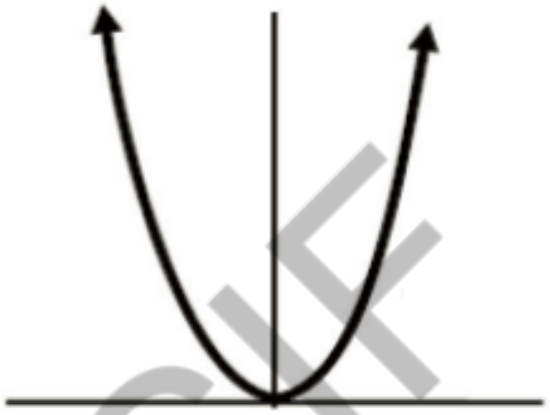








Quadratic Function

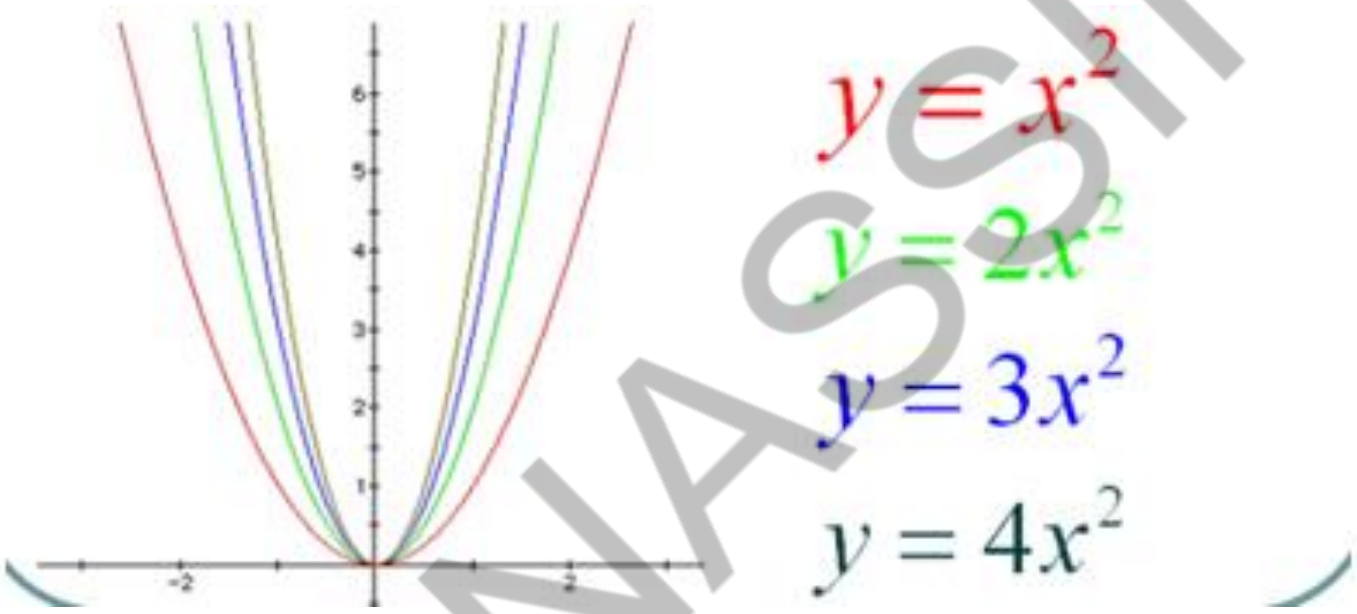


The equation is _____

This U-shape is called _____ and always passes through the _____. It is also symmetrical over the ___ axis.

The ‘a’ plays 2 roles:

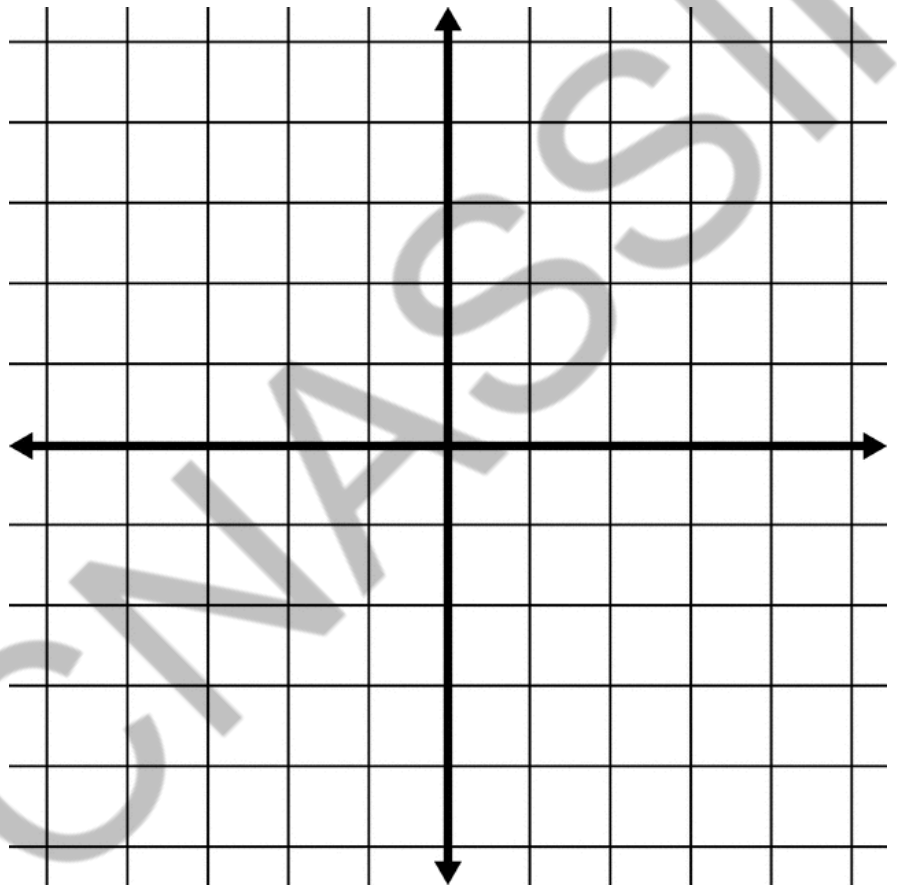
1) **The bigger the value of ‘a’, the _____ the parabola gets.**



2) **If the ‘a’ is _____, then the parabola opens downwards.**

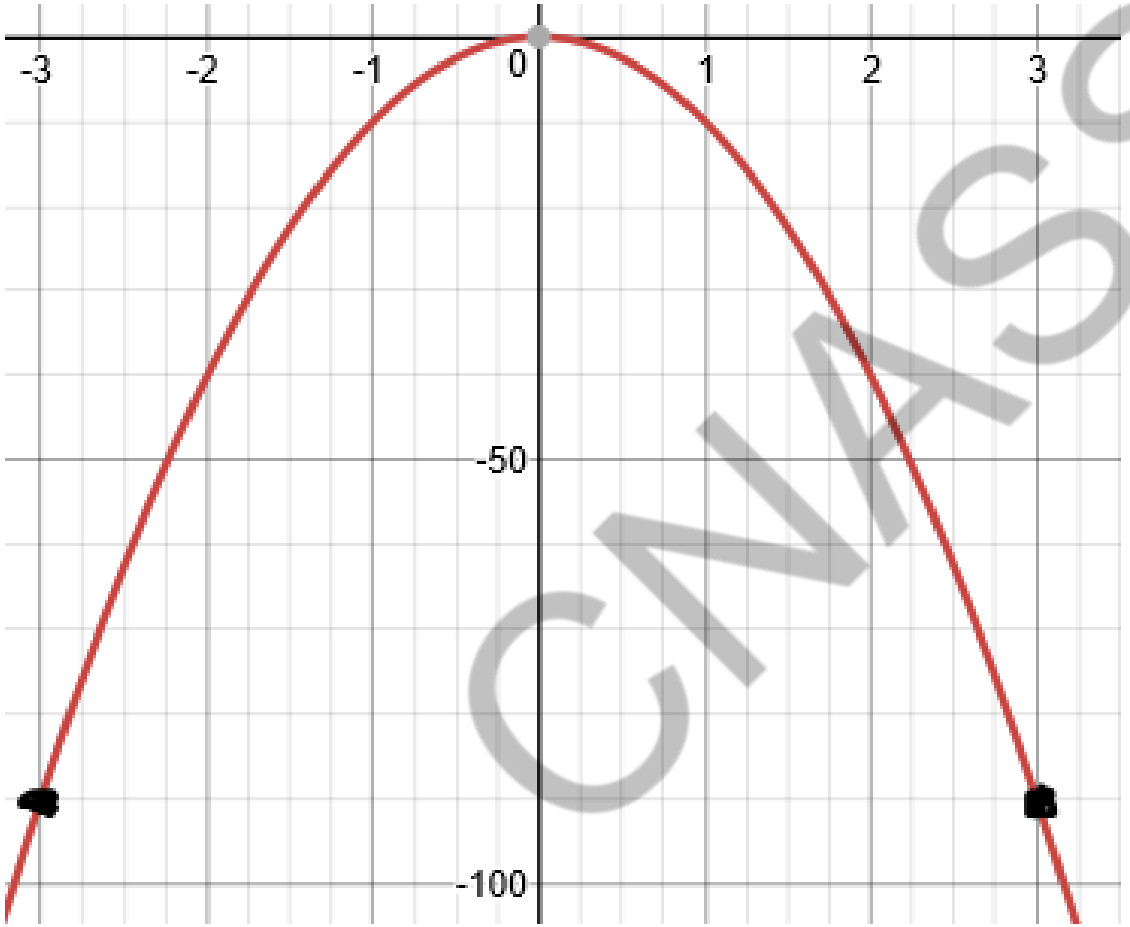
HOW TO GRAPH

$$f(x) = -1x^2$$



Quadratic function

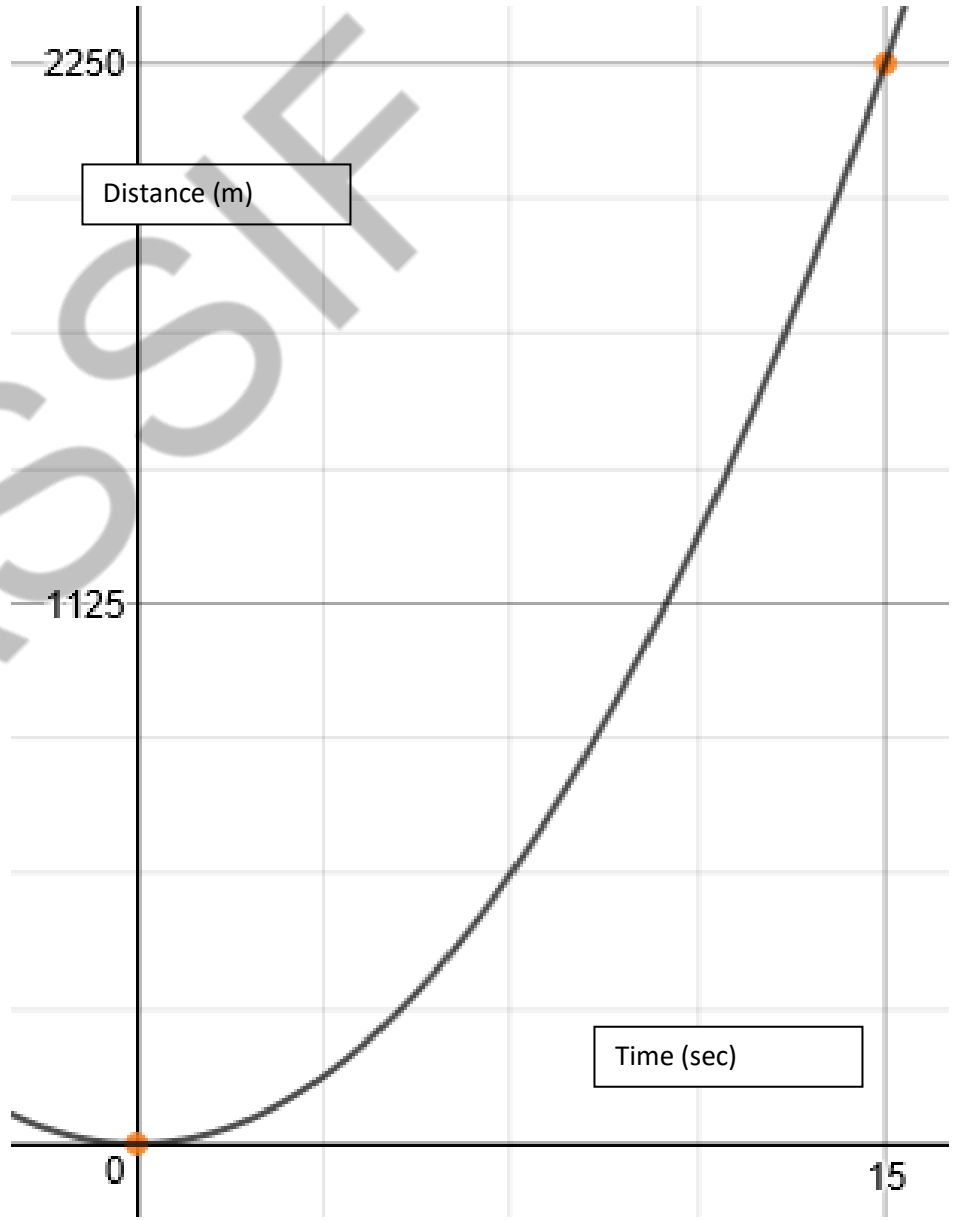
Finding the rule from a graph



Word Problems:

Below is the graph of a rocket before launching.

a. Define the variables and find the rule.



b. At what distance is the pilot after 20 seconds?

c. How much time after ejection is the pilot 9000m away from initial point of ejection?

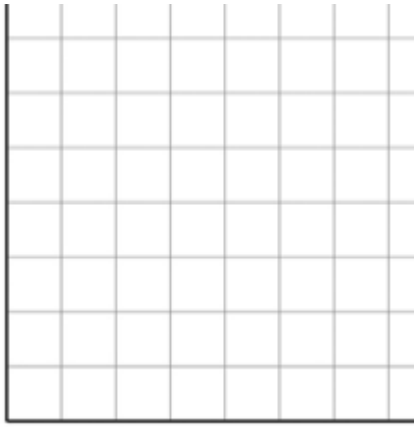
Functions Booklet page 1-9

EXPONENTIAL FUNCTION

Real Life Situations:

The equation is: _____

The graph looks like:



Note: The exponential function is the shape of a _____ and not a _____.

HOW TO FIND THE BASE ‘C’

30%

30%

DO $1+$

DO $1-$

Doubles means c =

Triples means c =

Quadruples means c =

EXPONENTIAL FUNCTION

Finding the equation

1) ↑ 11%, IV= 20 000$

2) ↓ 5%, IV = 5 000 lizards

3) ↑ 7%, IV = 1 inhabitant

4) ↓ 4%, IV = 50 bacteria

Solve for x

If $y = 74.6$, solve for x in the equation

$y = 30(1.2)^2$.

If $y = 13$, Solve for x in the equation

$y = 100(0.6)^x$.

Word Problems

1. Your hands contain 2000 bacteria. The value doubles per hour. How much bacteria will there be after 5 hours?

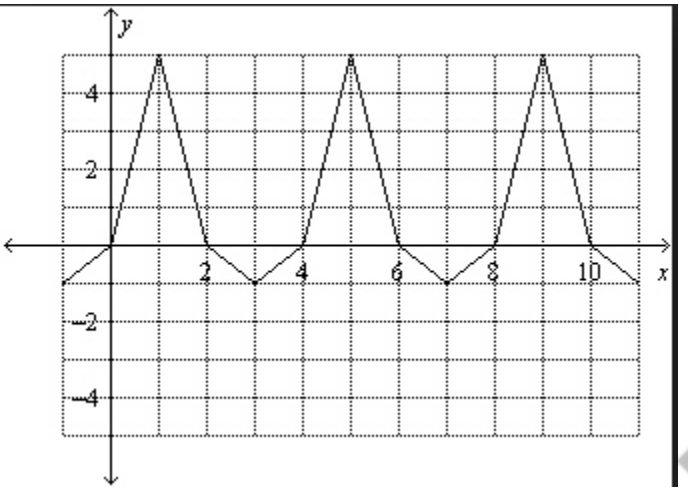
2. In 1990, a house valued 200 000$ and increased by 7% yearly. How much will it be worth in 1996?

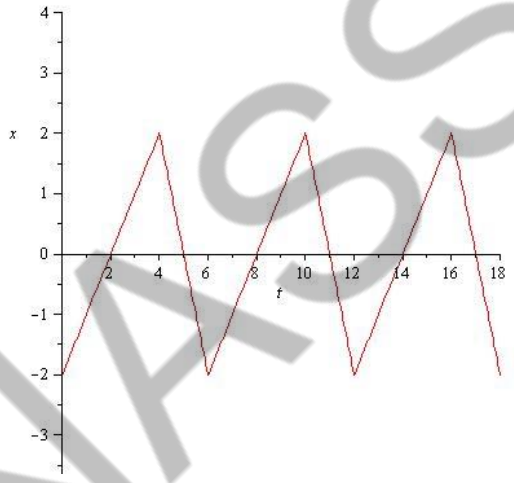
3. An antique car costs 30 000$ and increases in value by 10% per year. How much was the car worth 3 years ago?

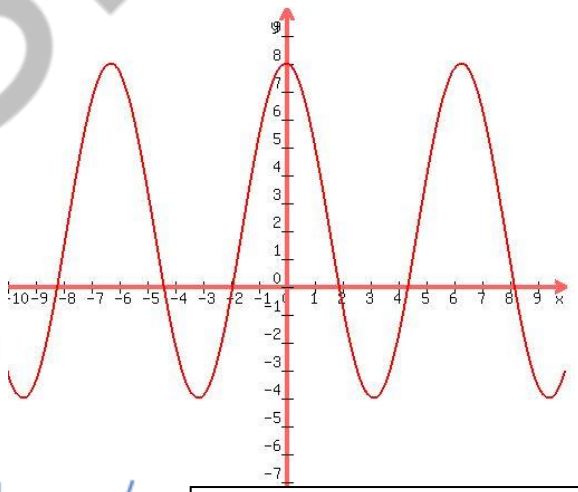
Functions Booklet page 10-14

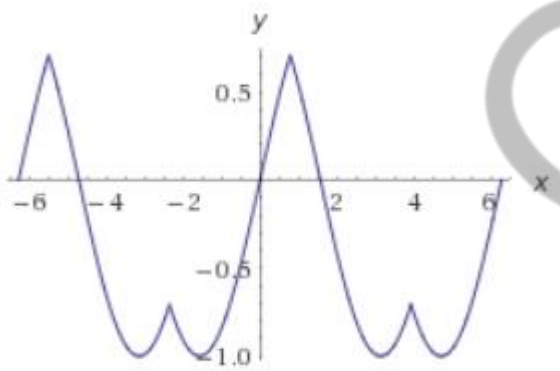
Periodic function

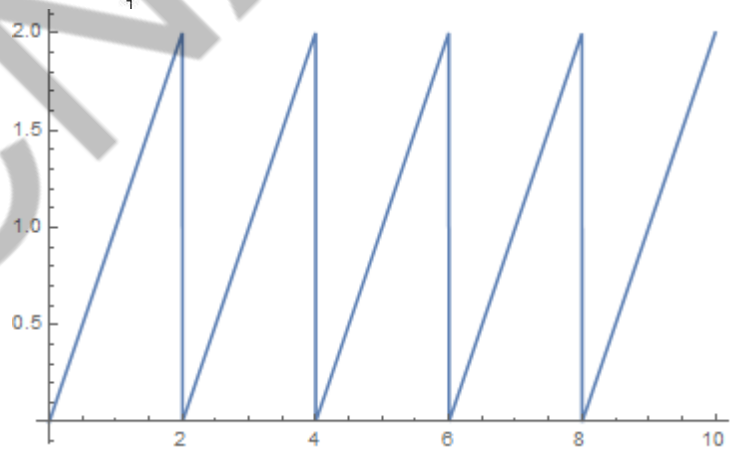
A periodic function is a function which always repeats itself.





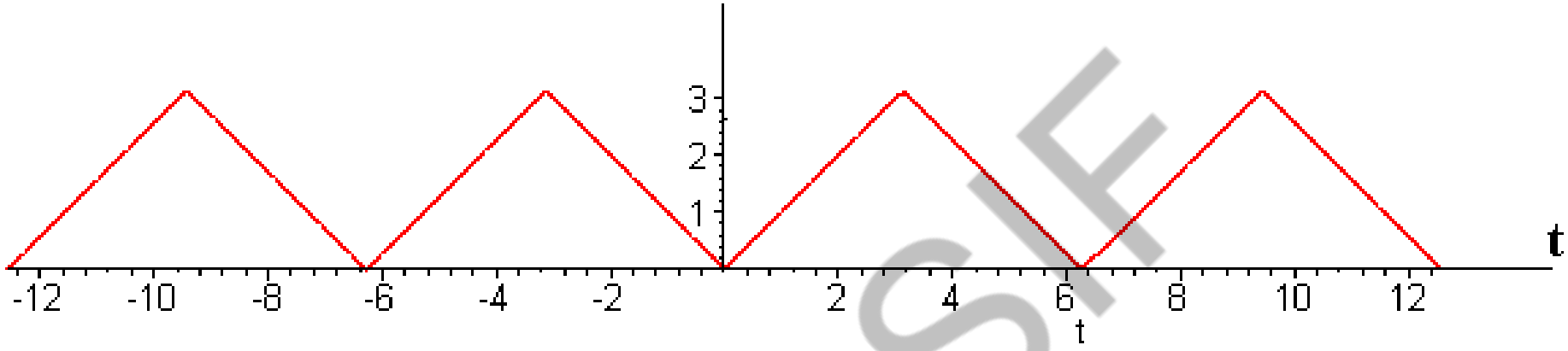






DO NOT COPY GRAPHS

Copy Graph



Three terms:

Cycle:

Period:

Frequency:

$f(0) =$

$f(2) =$

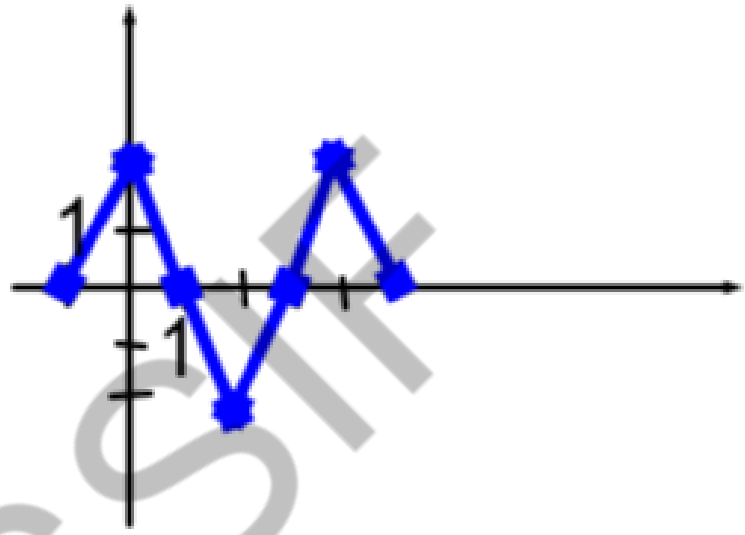
$f(5) =$

$f(22) =$

$f(-11) =$

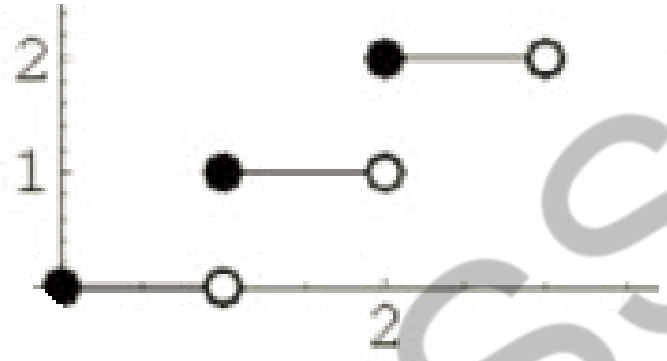
$f(17) =$

$f(-15) =$



Functions Booklet page 15-27

Step Function



A function that increases or decreases abruptly from one constant value to another.

● ○

The function has no _____

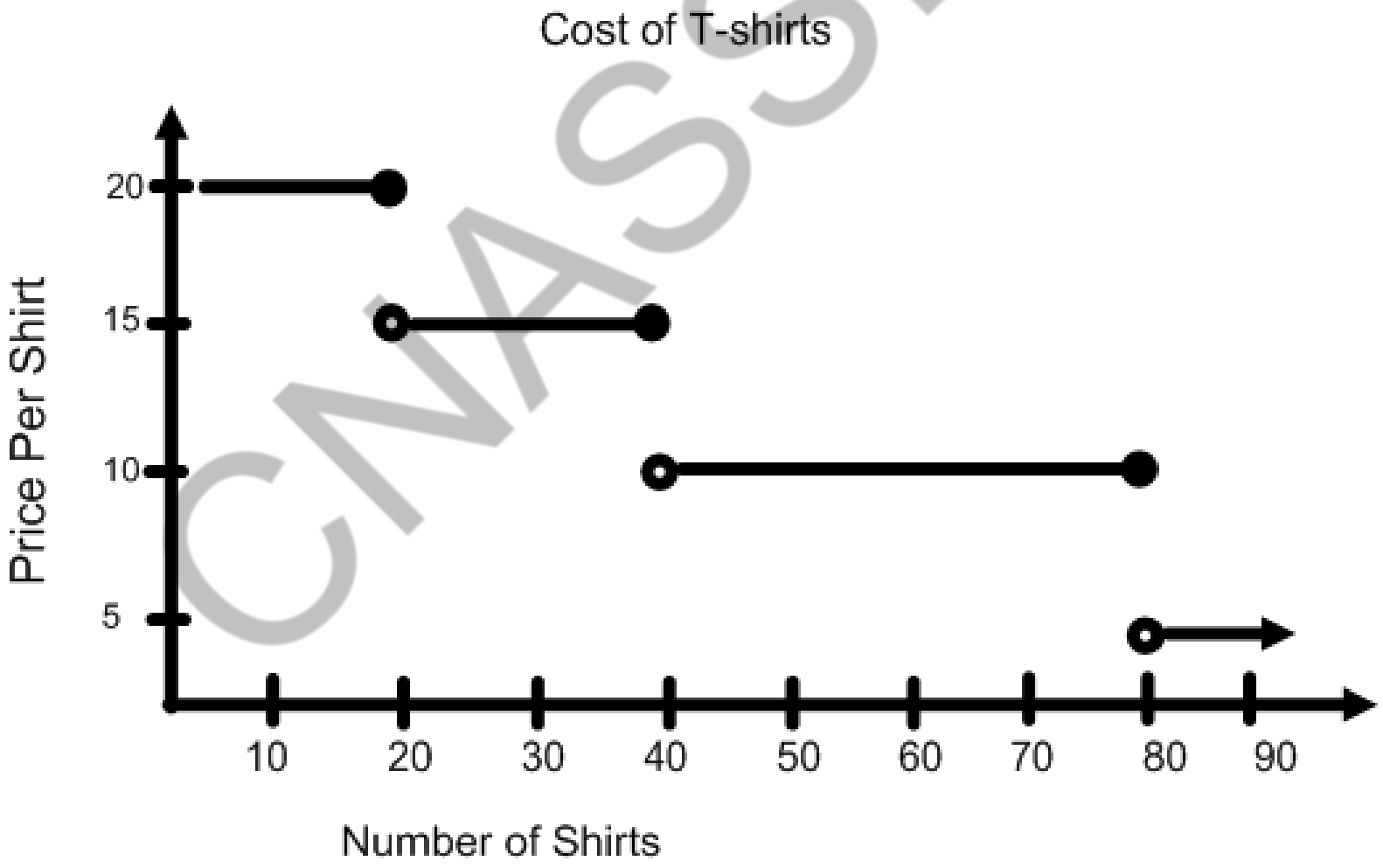
The graph contains horizontal segments _____ on one end and _____ on the other.

Find $f(0)$ meaning when $x = 0$, $y =$

Find $f(10) =$

Find $f(40) =$

Find $f(120) =$

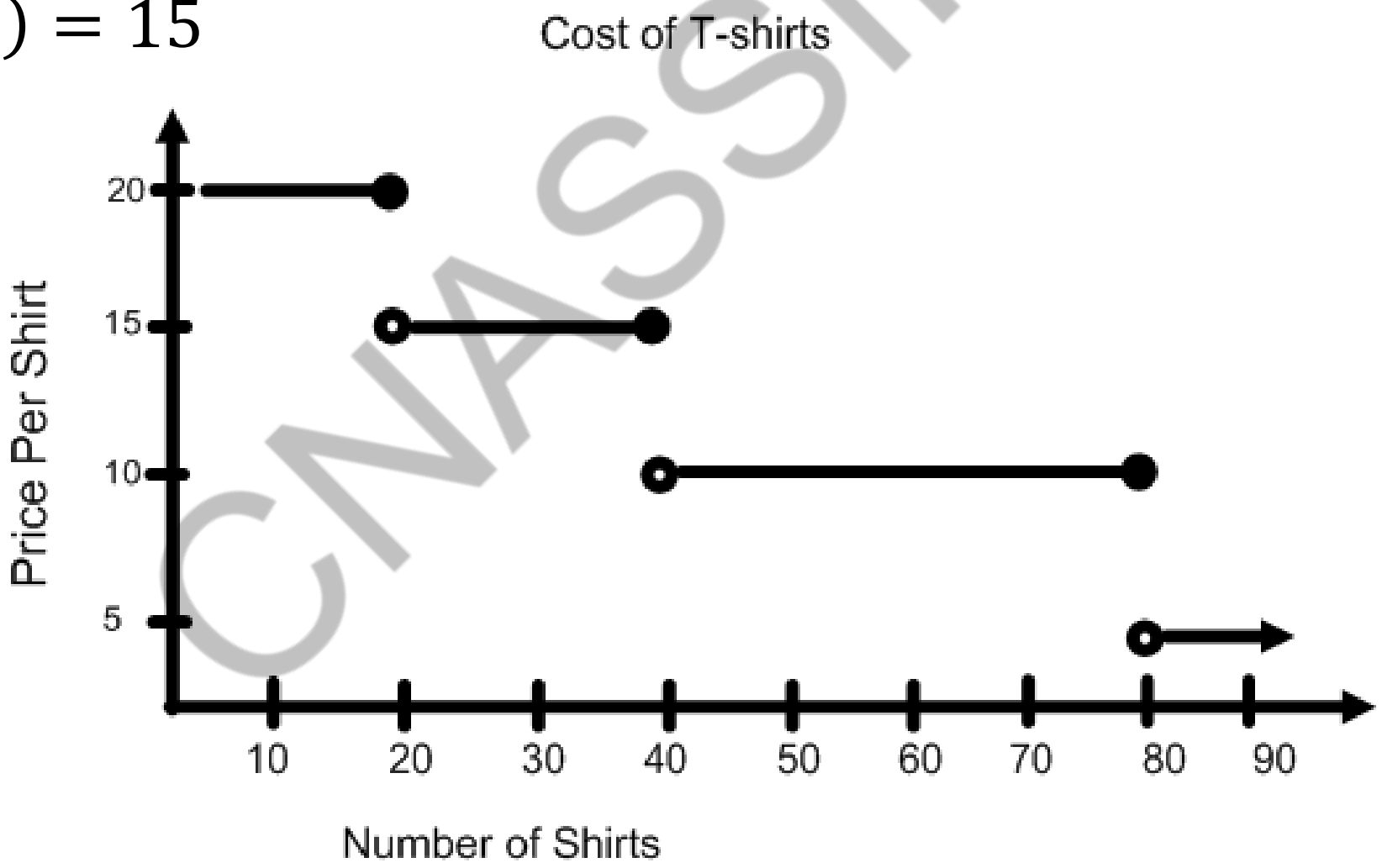


Find the values of x for which

$a)\ f(x) = 10$

$b)\ f(x) = 5$

$c)\ f(x) = 15$



Word Problems:

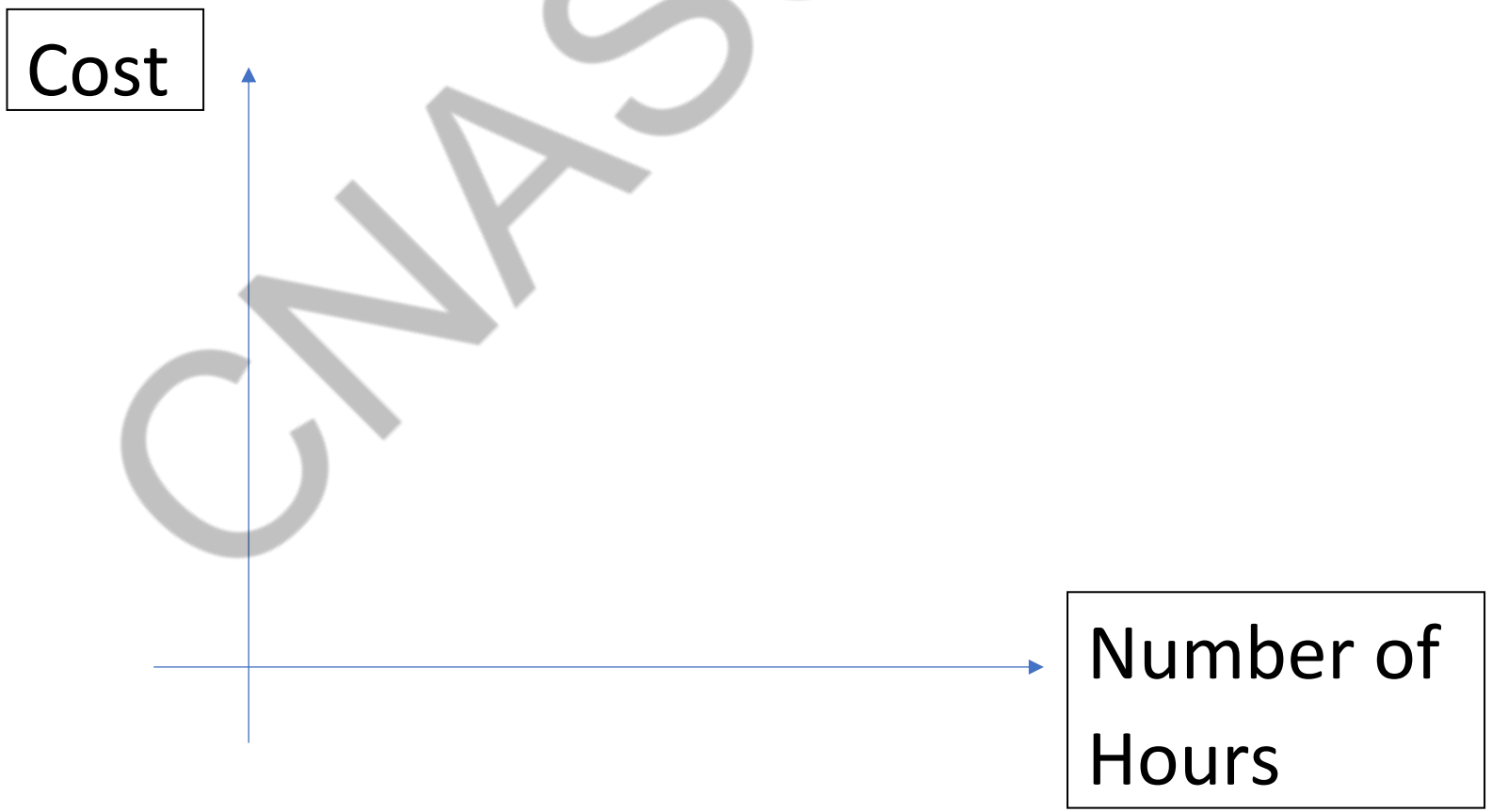
Talking about parking lots… Did you know about the BMW Welt in Germany?

Youtube:

Discover the BMW Welt - BMW Group

https://youtu.be/FjM94ZpWib4

Ex: A parking lot charges 5$ the first hour or part thereof plus 1$ every additional hour or part thereof. Make a table of values and then graph. Find the cost of parking for 5 hours.



Word Problems

1. A salesman receives a weekly base salary of 200$ plus a bonus of 30$ for every 500$ in sales made during the week.

a) Make a table of values and graph.

b) What will his salary be if he makes 946$ in sales in one week? (use tov)

c) In which interval lies the amount of sales made in a week where the salesman receives a salary of 290$? (use tov)

2. Canada Post charges 4$ for a mass less than 40g and 1.50$ for each additional 40g.

   a. Make a table of values and graph.

   b. What is the cost of sending a 168g parcel? (use tov)

c. In what interval lies the mass of a parcel if it costs 10$? (use tov)

Functions Booklet page 28-55

Review of Functions

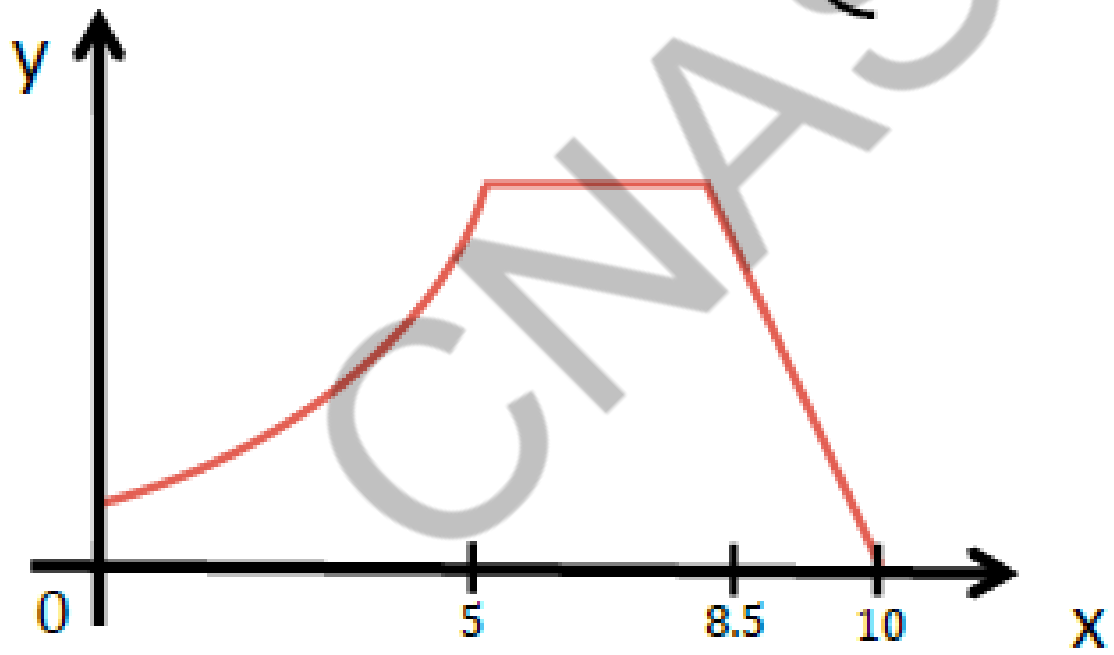
	Equation	Graph
Exponential		
Quadratic		
Periodic		
Step		

Functions Booklet

pages 1-55

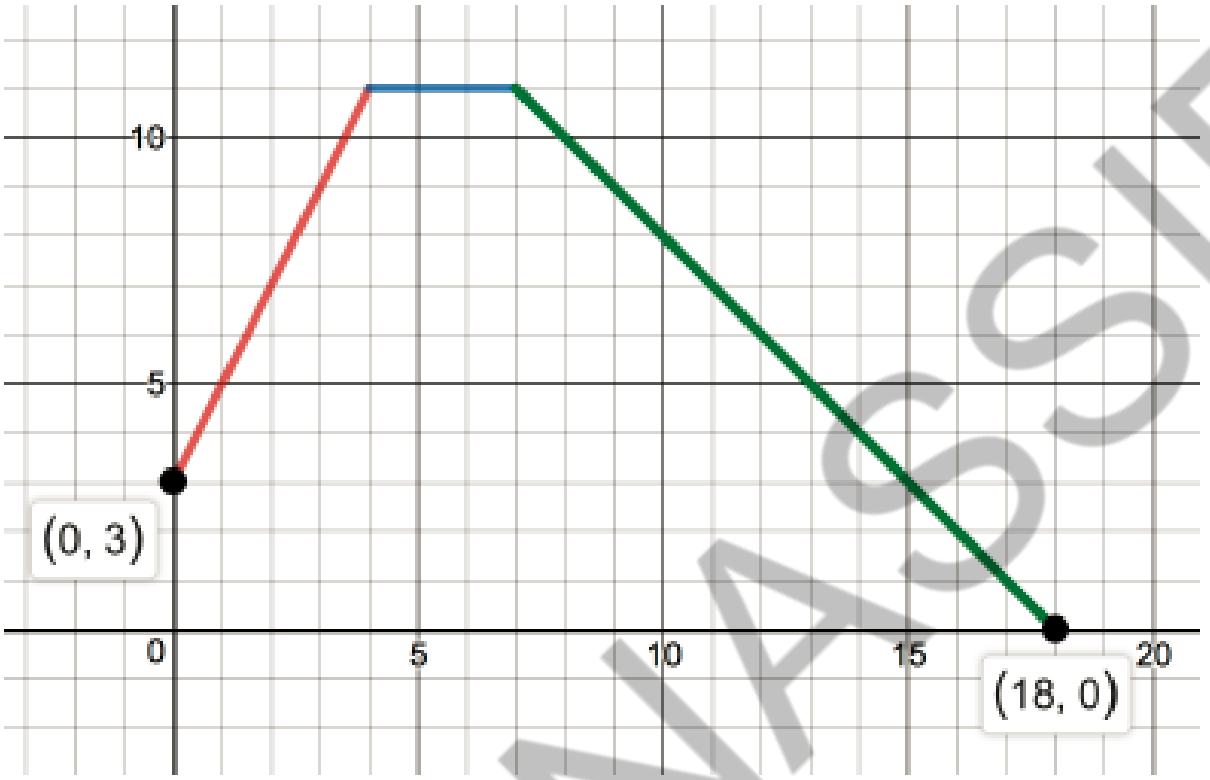
Piecewise Function

$$f(x) = \begin{cases} 2(1.20)^x & ; \ 0 \le x \le 5 \\ 5 & ; \ 5 \le x \le 8 \\ -2x + 21 & ; \ 8 \le x \le 10.5 \end{cases}$$



Find $f(8.5)$

How to read the graph:



Find $f(0) =$

Find $f(5) =$

Find $f(10) =$

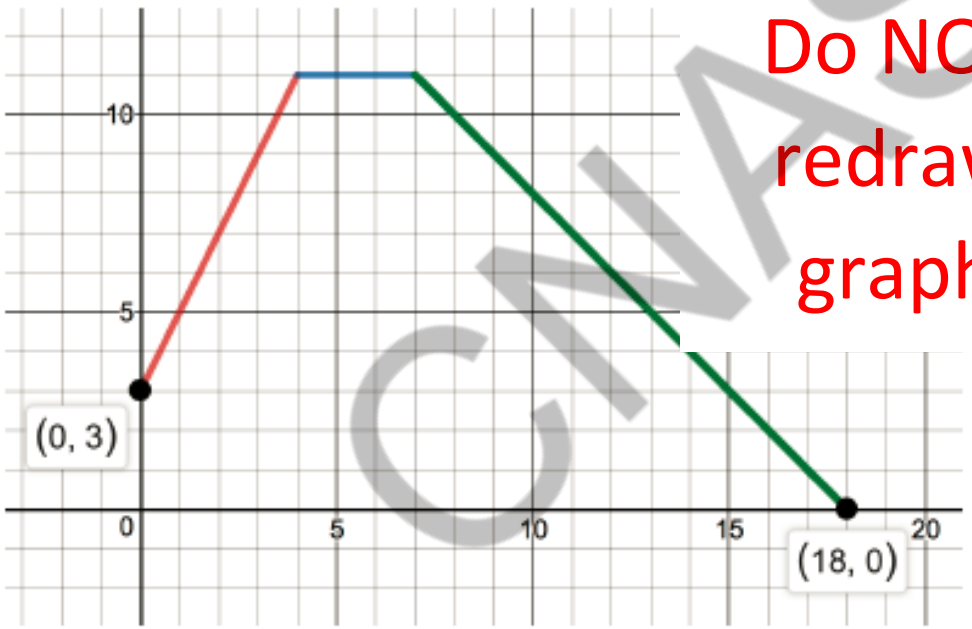
Find x when $f(x) = 7$

Find x when $f(x) = 9$

Find x when $f(x) = 3$

How to read the equation:

$$f(x) = \begin{cases} 2x + 3 & , \quad 0 \leq x \leq \_\_\_\_ \\ \_\_\_\_\_ & , \quad \_\_\_\_ \leq x \leq \_\_\_\_ \\ -x + 18 & , \quad \_\_\_\_ \leq x \leq 18 \end{cases}$$



Do NOT redraw graph

Use the equation

Find the y value

$f(10)=$

$f(3.5)=$

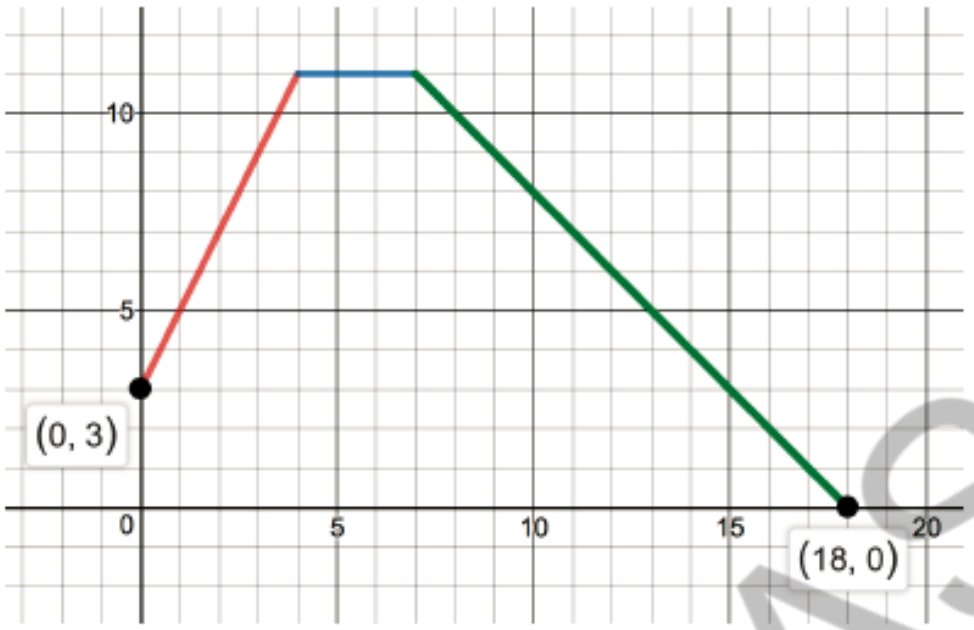
$f(5)=$

Find the x value

If $f(x) = 5$ find x

If $f(x) = 7$ find x

If $f(x) = 6$, find the differences in the x values.



$$f(x) = \begin{cases} 2x + 3 & , \quad 0 \le x \le 4 \\ 11 & , \quad 4 \le x \le 7 \\ -x + 18 & , \quad 7 \le x \le 18 \end{cases}$$

Do NOT redraw graph/equations

Functions Booklet page 56-78