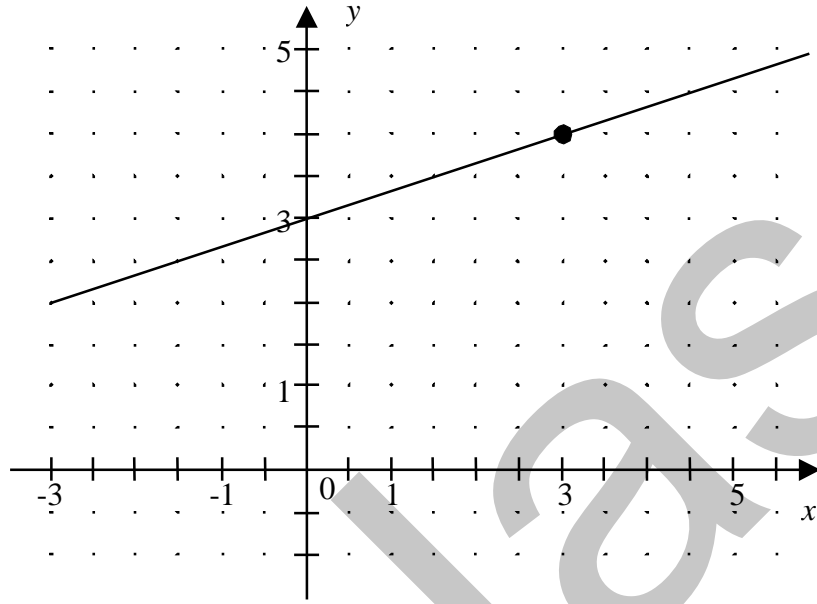


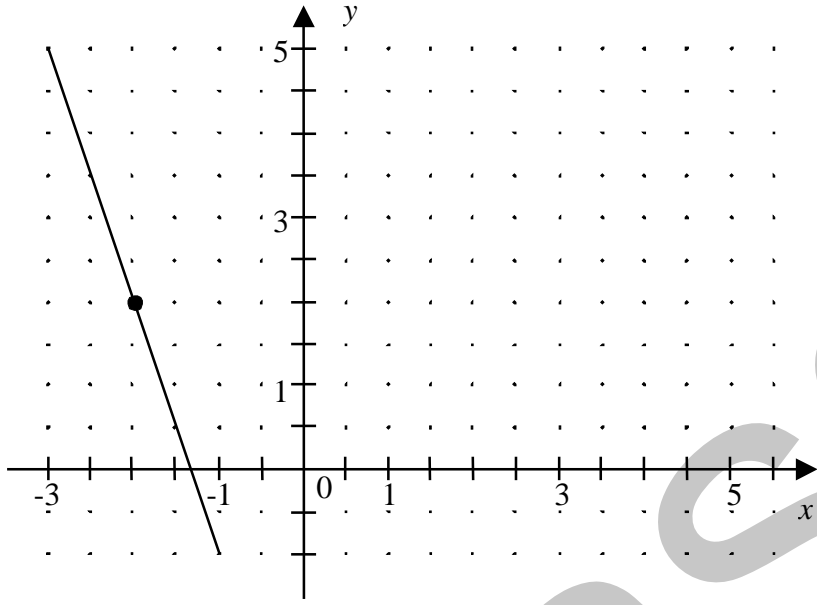
1

A

2

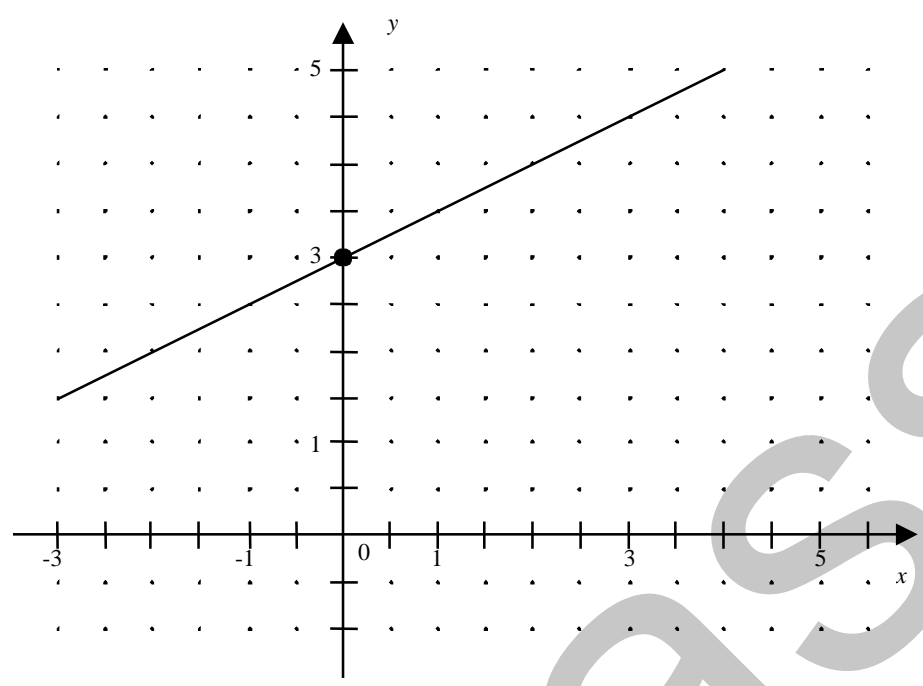


3



Ms. Nasserif

4



5

a) $x - 2y + 6 = 0$
d) $3x - y - 5 = 0$

b) $3x - 2y + 4 = 0$
e) $2x + y + 10 = 0$

c) $y = 2$

6

D

7

D

8 The equation that represents the function is $f(t) = 2.3t + 22.3$

or any other equivalent equation.

Examples : $y = 2.3x + 22.3$

$$y = 2.3t + 22.3$$

$$f(x) = 2.3x + 22.3$$

9 D

10 C

11 C

12 B

13

Work : (example)

Coordinates of point C, the midpoint of segment AB

Abscissa

$$\frac{x_C - x_A}{x_B - x_A} = \frac{1}{2}$$

$$\frac{x_C - 2}{8 - 2} = \frac{1}{2}$$

$$x_C = 5$$

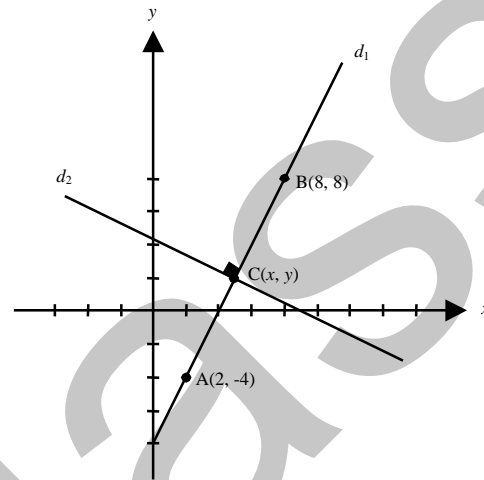
Ordinate

$$\frac{y_C - y_A}{y_B - y_A} = \frac{1}{2}$$

$$\frac{y_C + 4}{8 + 4} = \frac{1}{2}$$

$$y_C = 2$$

C(5, 2)



Slope of segment AB

$$m_{\overline{AB}} = \frac{y_B - y_A}{x_B - x_A} = \frac{8 + 4}{8 - 2} = 2$$

Slope of line d_2

$$m_{d_2} \times m_{\overline{AB}} = -1 \quad (\text{Because line } d_2 \text{ is perpendicular to segment AB.})$$

$$m_{d_2} \times 2 = -1$$

$$m_{d_2} = \frac{-1}{2}$$

Equation of line d_2

$$\frac{y-2}{x-5} = \frac{-1}{2}$$

$$x + 2y - 9 = 0$$

Result The equation of line d_2 is $x^2 + 2y - 9 = 0$.

Note : Accept an equivalent equation.

14 B

15 The equation is $2x - 5y + 10 = 0$ or $y = \frac{2}{5}x + 2$.

or any equivalent equation.

16 Work : (example)

Equation

$$q(d) = 51 - 3d$$

There remains 21 litres

$$21 = 51 - 3d$$

Solution of the equation.

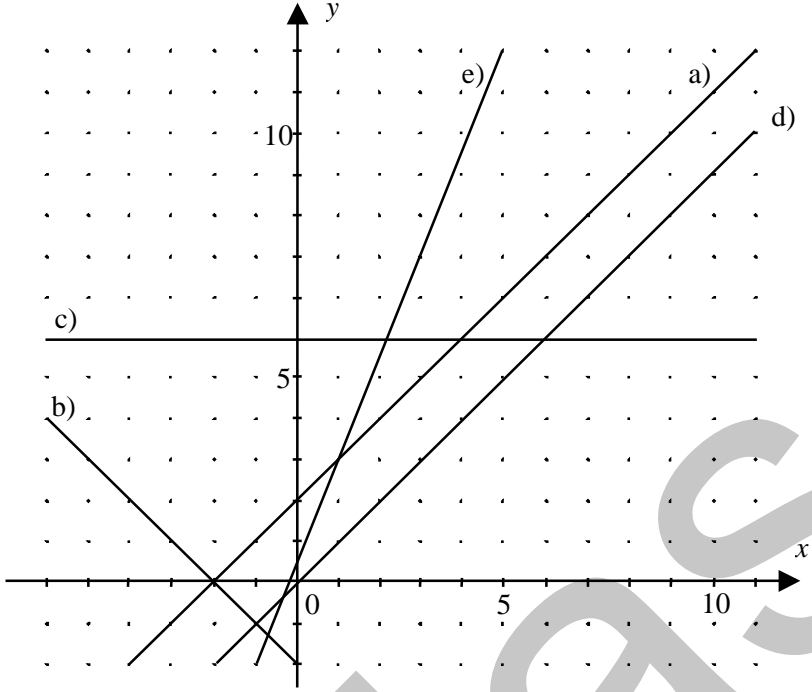
$$3d = 30 \text{ or } d = 10$$

Result 21 litres remain in 10 days.

Accept other solutions with the correct answer.

17 The function is defined by $c(x) = 6x + 4$.

Accept any other equivalent equation.



MS. N. S. S. f

19 Work : (example)

Let d be the price of a desk

Equation

$$12d - 500 = 1300$$

Price of a desk

$$12d = 1800$$

$$d = 150$$

Number of desks

Let x be the number of desks made.

$$150x - 500 = 1750$$

$$150x = 2250$$

$$x = 15$$

Result He made 15 desks.

Accept other solutions which lead to the right answer.

20 D

Given C : the cost of delivering a package

f : the fixed basic rate

a : the additional amount per kilogram

m : the mass of the package in kilogram.

The equation is : $C = ma + f$

Solution of the system of equations

$$13 = 4a + f$$

$$45 = 20a + f$$

$$\text{Thus : } f = 5 \text{ and } a = 2$$

The cost of delivering a 12 kg package is

$$C = 12 \times 2 + 5$$

$$C = 29$$

Result The cost of the delivery is \$29.

Any other complete and acceptable work with the correct result.

The student uses knowledge of constant and affine functions to solve the problem.

22 C

23 The function is defined by $p(a) = \frac{a}{2} + 100$

or any other equivalent equation.

24 C

25 C

26 He will pay \$1050 for a delivery of 500 metres of material.

27 The faucet will lose 84 litres in 7 days.

28 The function is : $f(x) = 50 - 25x$

Any other equivalent function.

29 Work : (example)

Given n the number of umbrellas

$P(n)$ the profit

Equation: $P(n) = (150 - 70)n - 16\,400$

Solution of the equation

$$1200 = 80n - 16\,400$$

$$n = n = 220$$

Result The manufacturer must sell 220 beach umbrellas to make a profit of \$1200.

Work :

Example 1

Given x the number of years

$f(x)$ the number of kilograms

The function $f(x) = 8x + 750$, beginning in 1950.

The solution of the function

$$1118 = 8x + 750$$

$$x = 46$$

$$\text{and } 1950 + 46 = 1996$$

Result : We will need 1118 kg of cereal per animal in the year 1996.

Any other complete and acceptable work with the correct result.

Example 2

Given x the number of years

$f(x)$ the number of kilograms

The function $f(x) = 8x - 14\,850$, beginning in the year 0.

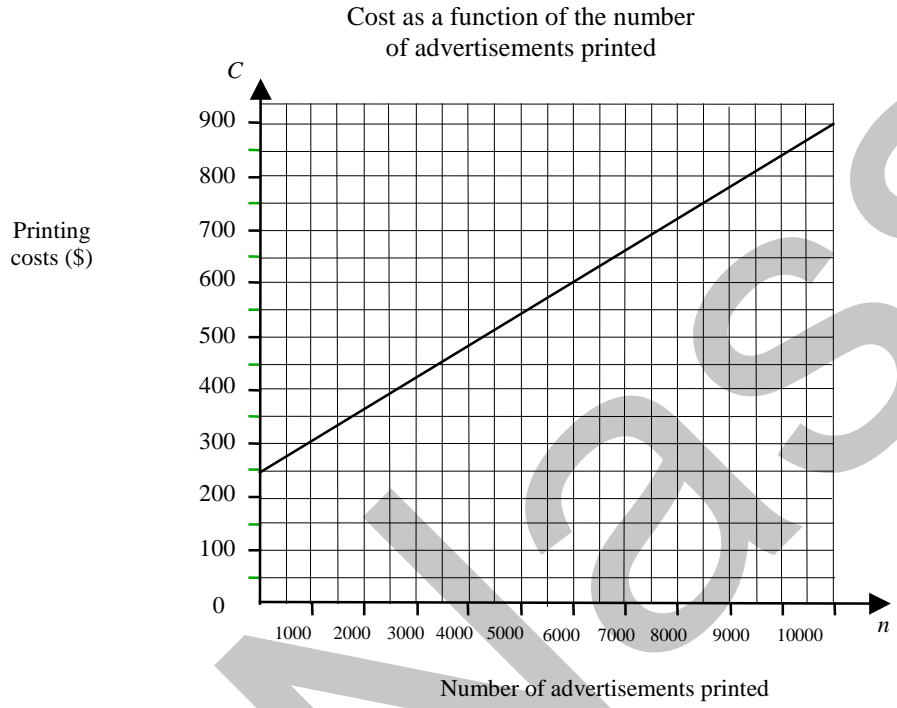
The solution of the function

$$1118 = 8x - 14\,850$$

$$x = 1996$$

Result We will need 1118 kg of cereal per animal in the year 1996

31



32 A

33 D

34 The equation that defines this function is : $C(x) = 0.01x$

or an equivalent equation.

35 B

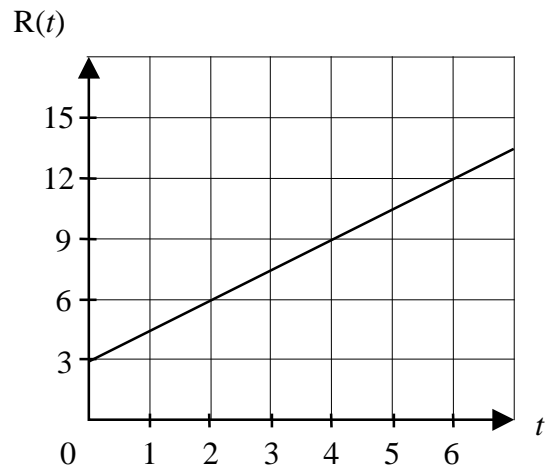
36 D

37 A

38 C

MS. Nassif

39



40 The price of his ticket is \$45.

41 A

42 B

43 B

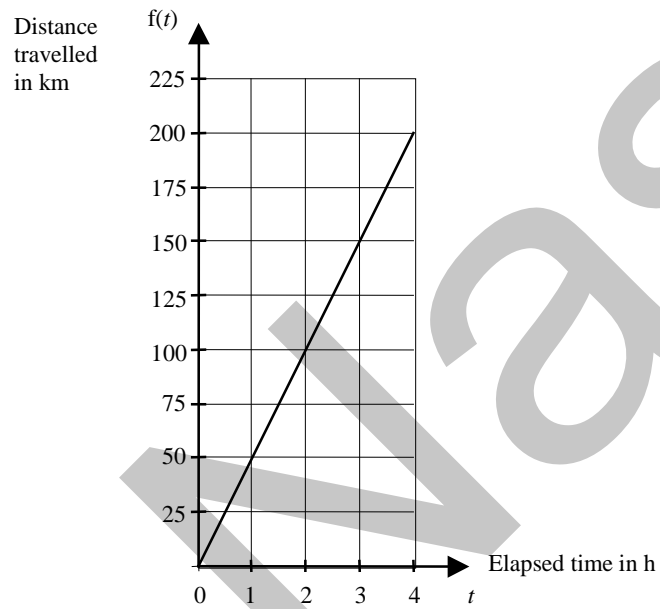
44

The equation is $f(x) = \frac{5x}{4} + 2$ or $5x - 4y + 8 = 0$

or any other equivalent expression

45

The graph of the function



46 The equation that represents the quantity of water as a function of time t is

$$Q(t) = -2000t + 20\,000$$

or any equivalent equation.

47 C

48 D

49 The equation that expresses this function is : $S(m) = 0.01s + 100$.

or

Any other equivalent equation.

50 D

51 The equation of line l is $y = -3x + 19$.

(Accept other equivalent forms. Ex: $3x + y - 19 = 0$)

52 The slope is $\frac{3}{4}$ or 0.75.

The x-intercept is -8

Name : _____

Group : _____

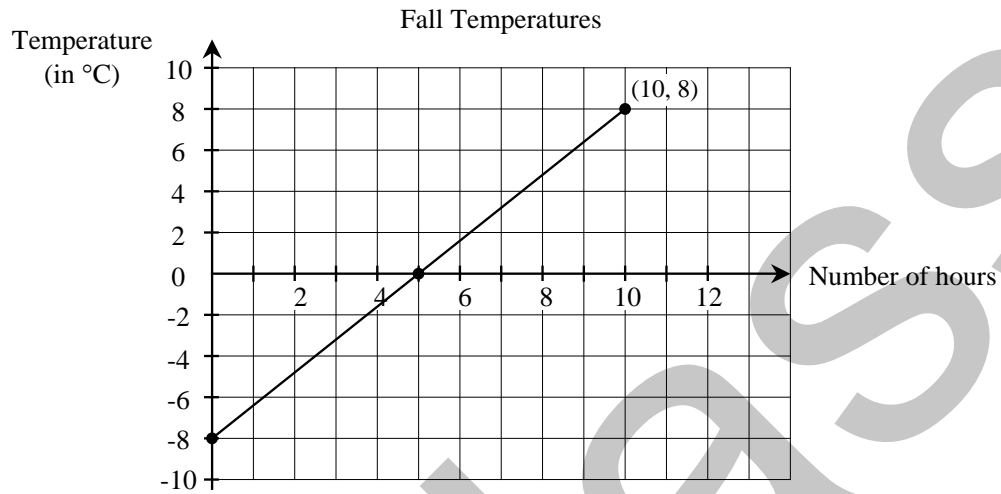
Date : _____

568426 - Mathematics

Question Booklet

Ms. Narasimha

- 1 Temperature readings on any given day in Québec can vary greatly. The temperatures for a fall day in Montreal were recorded over a 10-hour interval. The graph below represents this situation, with x being the number of hours that have elapsed since the temperature was first recorded, and y being the temperature in degrees Celsius.



What are the values of the slope, the zero, and the initial value, respectively?

A) $\frac{8}{5}$, 5, -8

C) $\frac{5}{8}$, -8, 5

B) $\frac{8}{5}$, -8, 5

D) $\frac{5}{8}$, 5, -8

- 2 Draw the straight line which passes through point C (3, 4) and has slope $m = \frac{1}{3}$

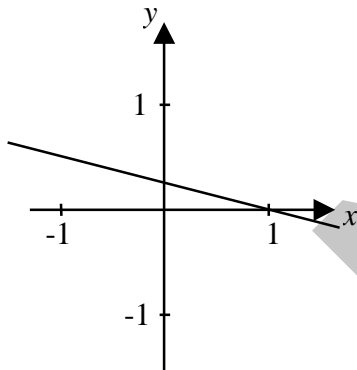
3 Draw the straight line which passes through point B (-2, 2) and has slope $m = -3$.

4 Draw the straight line which passes through point A(0, 3) and has a slope $m = \frac{1}{2}$.

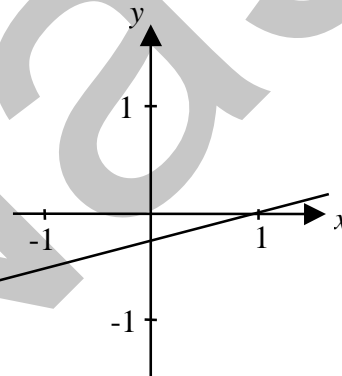
6 The slope of a linear function is -4 and its y-intercept is 1.

Which of the following graphs represents this function?

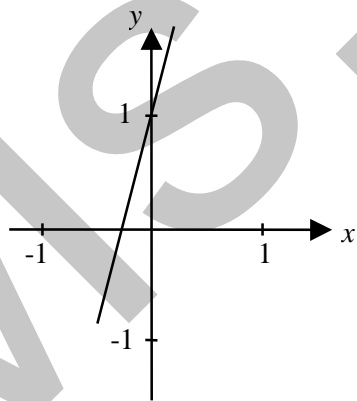
A)



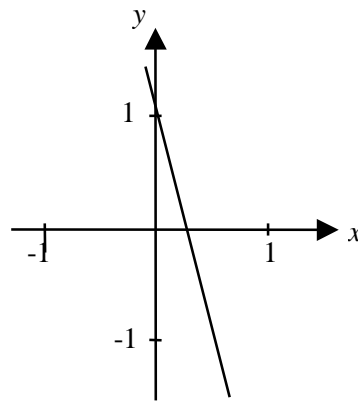
C)



B)



D)



7 The x-intercept of a line is -4 and its y-intercept is 6.

Which equation represents this line?

A) $2x - 3y + 12 = 0$

C) $2x - 3y - 12 = 0$

B) $3x - 2y - 12 = 0$

D) $3x - 2y + 12 = 0$

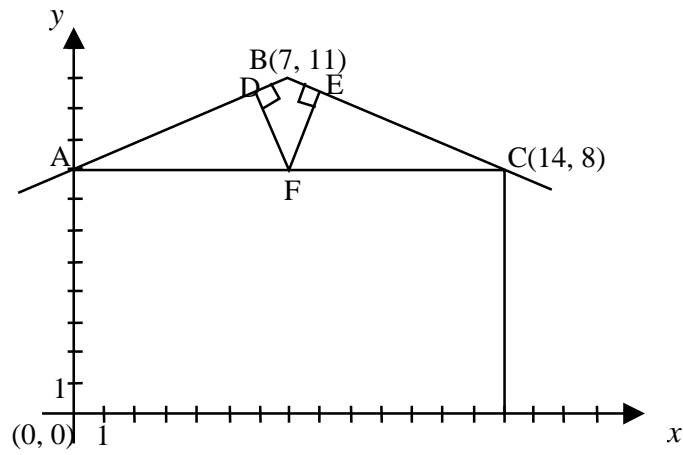
8 An experiment consists of mixing two liquids and observing the change in temperature of the mixture. The results are presented in the table below.

Time elapsed (in minutes)	Temperature (in °C)
2	26.9
4	31.5
7	38.4
10	45.3

The phenomenon can be expressed by a linear function which associates the temperature $f(t)$ of the mixture with the elapsed time t .

What equation represents this function?

9 An architect drew the plan of a lateral side of a house in a Cartesian plane.



If F is the midpoint of \overline{AC} , which equation represents the support \overline{EF} , given that it is perpendicular to \overline{BC} ?

A) $7x + 3y - 73 = 0$

C) $7x - 3y - 35 = 0$

B) $7x + 3y - 77 = 0$

D) $7x - 3y - 25 = 0$

- 11 Line AB represented in a Cartesian plane has as its equation $2x + y - 5 = 0$. Line CD, which is perpendicular to line AB, passes through the point $(2, 4)$.

What is the equation of line CD?

- A) $2x + y - 8 = 0$ C) $x - 2y + 6 = 0$
B) $x + 2y - 10 = 0$ D) $2x - y = 0$

- 12 In a Cartesian plane, a line with slope $-\frac{2}{3}$ passes through the point $(3, 0)$.

What is the equation of this line?

- A) $2x + 3y + 3 = 0$ C) $3x + 2y - 3 = 0$
B) $2x + 3y - 6 = 0$ D) $3x + 2y - 9 = 0$

- 13 In a Cartesian plane, line d_1 passes through the points A(2, -4) and B(8, 8). Line d_2 is perpendicular to segment AB and passes through the midpoint of this segment.

What is the equation of line d_2 ?

- 15 The x-intercept of a line is -5 and its y-intercept is 2.

Which equation can be used to represent this line?

- 16 A fountain contains 51 litres of water. Water evaporates at the rate of 3 litres per day. This can be translated into a function which associates the quantity of water q remaining in the fountain with the number of days d .

In how many days will there be 21 litres remaining in the fountain?

Show the construction marks of your solution.

- 17 A student has a job maintaining swimming pools. He charges a base price for each visit and adds on an hourly rate.

For example, he charges \$22 for 3 hours work and \$34 for 5 hours.

Write a function to represent this situation.

18 Represent the following functions graphically.

a) $f(x) = x + 2$

b) $f(x) = -x - 2$

c) $f(x) = 6$

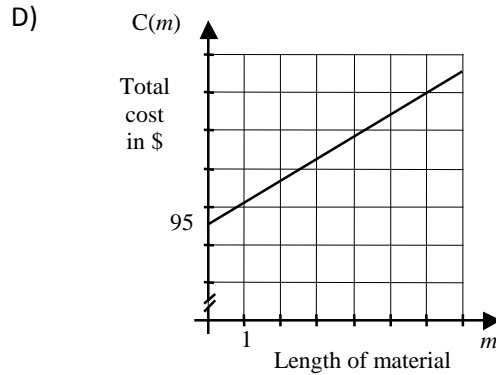
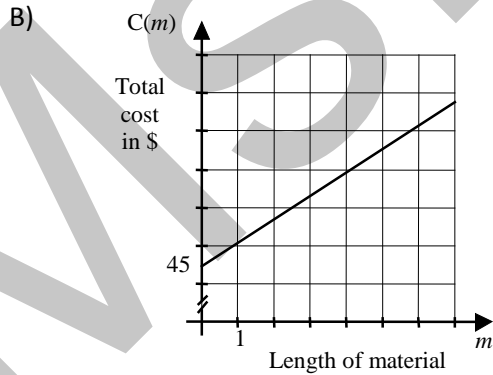
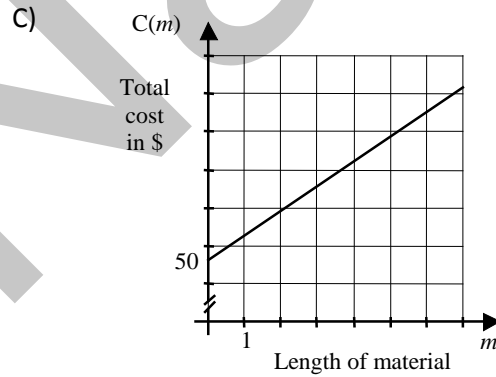
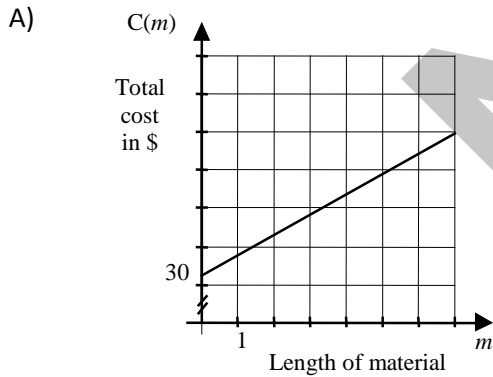
d) $f(x) = x$

e) $f(x) = 2x + 3$

19 A desk manufacturer has expenses of \$500 per day whether or not he produces desks. On one day when he produced 12 desks, he made a profit of \$1300.

How many desks does he produce on a day when his profit is \$1750?

20 A customer buys some material and the accessories needed to hang some curtains. The accessories cost \$45, the material costs \$30 per metre and the installation fee is \$50. Which one of these graphs represents the total cost of the installed curtains?

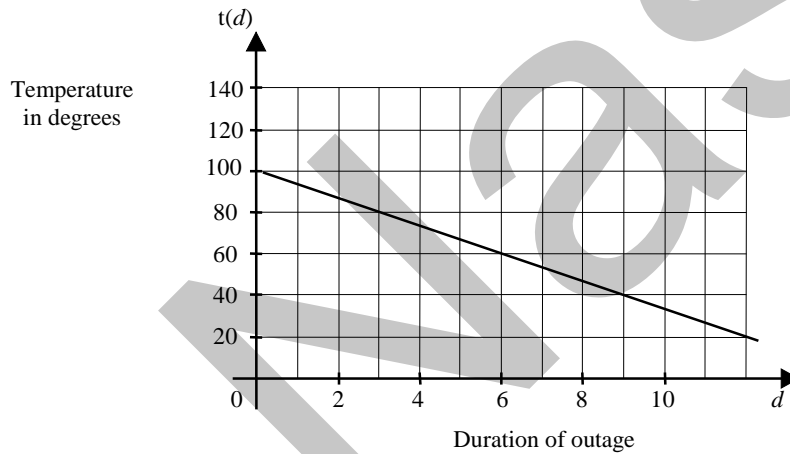


21 To deliver merchandise, a delivery service charges a fixed basic rate plus an additional amount per kilogram.

One day, a client pays \$13 for a package weighing 4 kg. Another day, he pays \$45 for a package weighing 20 kg.

How much would he pay for a package that weighs 12 kg?

22 The variation in the temperature in a hot water heater is a function of the time of a power outage and is represented by the following graph.



Which of the following equations will give the temperature of the water $t(d)$ as a function of the time of the power outage?

A) $t(d) = 100d - \frac{3}{20}$

B) $t(d) = \frac{-3d}{20} + 100$

C) $t(d) = \frac{-20d}{3} + 100$

D) $t(d) = \frac{-20d}{3}$

23

A patient's systolic blood pressure $p(a)$ is taken regularly in a hospital. It is known that this pressure varies as a function of the patient's age.

The systolic blood pressure of a 20 year old is usually 110 while that of a 50 year old is 125.

What function can be used to represent this situation?

A car consumes an average of 10 litres of gas for every 100 kilometres. It takes 60 litres to fuel up the gas tank.

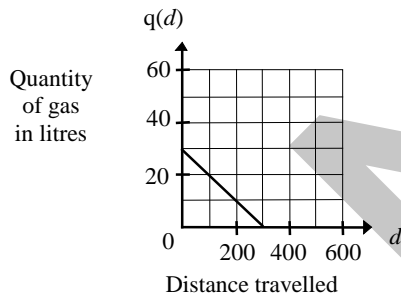
There were 35 litres of gas left in a car's gas tank after it had been driven 250 kilometres. This situation can be represented by :

$q(d)$: the quantity of gas remaining

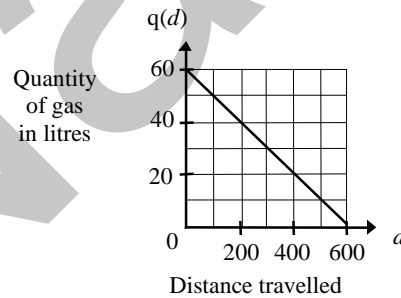
d : the distance travelled in kilometres

Which graph illustrates the quantity of gas remaining in the gas tank at any given moment of the trip?

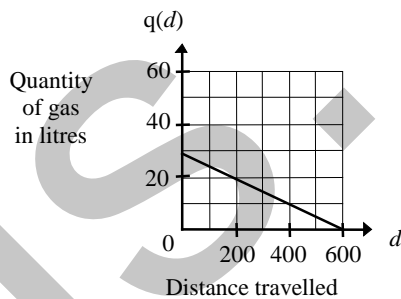
A)



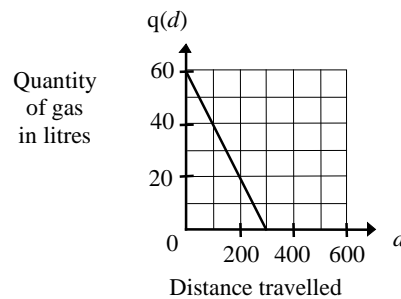
C)



B)



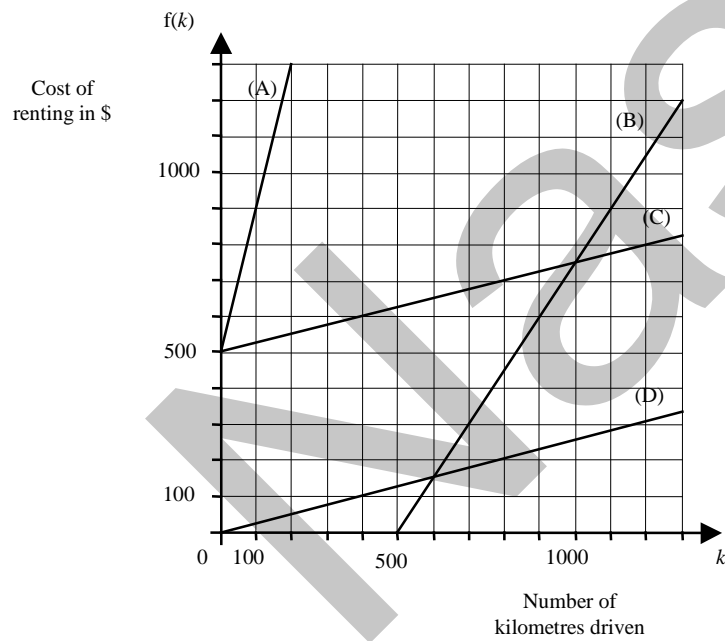
D)



25

To rent a car it costs \$500 plus \$0.25 for each kilometre that it is driven. So, for a 1000 km trip, it will cost \$750.

Which graph below (A, B, C or D) can be used to determine the cost of renting a car as a function of the number of kilometres driven?



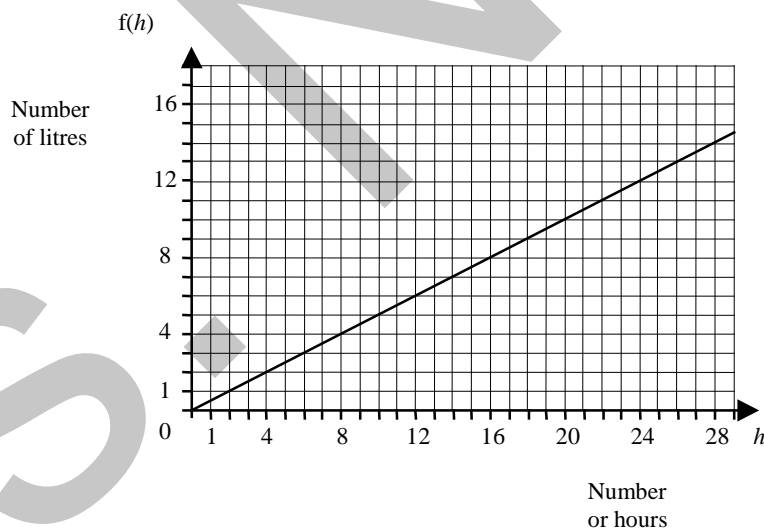
26 A tailor buys several types of material, all of equal quality and price. Delivery fees are fixed.

He paid \$850 for the delivery of 400 metres of material.

The second delivery of 700 metres cost \$1450.

How much will he pay for a delivery of 500 metres of material?

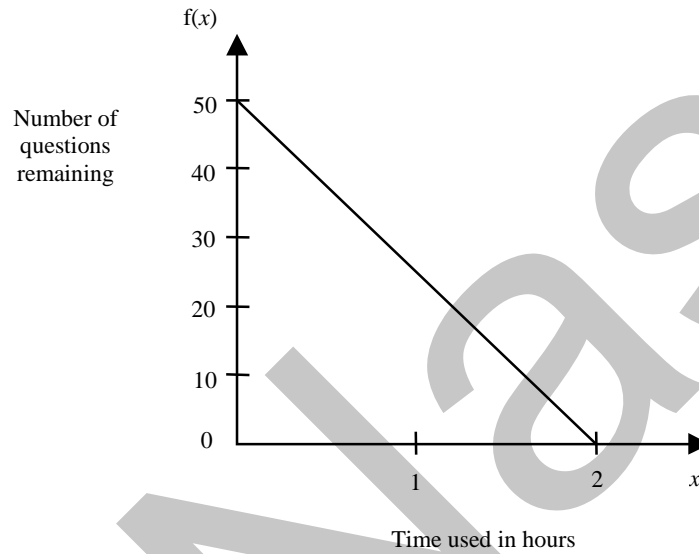
27 A kitchen faucet leaks. The graph below illustrates the number of litres of water lost as a function of the time in hours.



If nobody repairs the faucet, how many litres of water will be lost in 7 days?

28 A teacher allows Christian two hours to answer the 50 questions on an aptitude test.

The following graph represents the number of questions he has left to do as a function of the time he has used.



Write a function to show this situation.

29 A manufacturer sells beach umbrellas for \$150 each. Each one costs \$70 to make. He calculates that all other fixed costs (rent, salaries,...) come to \$16 000 per month.

How many beach umbrellas must he sell per month to earn a profit of \$1200?

Show all the work you have done to solve this problem.

30 In 1950, to feed animals for food consumption, an average of 750 kg of cereals had to be fed to each animal per year.

In 1974, it took 942 kg of cereals.

At this rate in what year will they need 1118 kg of cereal to feed each animal?

Show all the work you have done to solve this problem.

31 A store decides to print an advertisement for toys. The cost (C) of the ad can be found from the following formula:

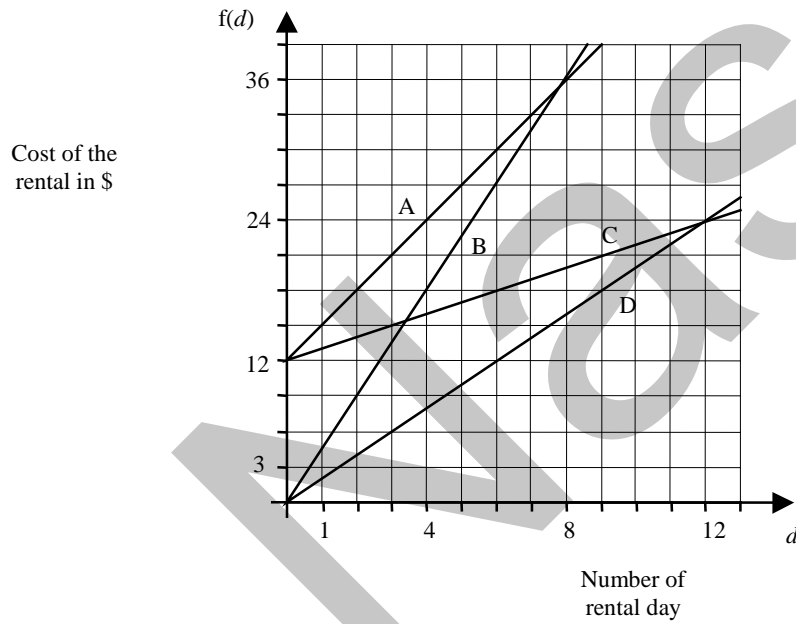
$$C = 0.06n + 250$$

where n represents the number of advertisements printed.

To find out how the cost increases according to the number printed, draw a graph of the formula.

32 To rent a VCR, it costs \$12 plus \$3 per day. So, for a rental of 8 days it costs \$36.

Which one of the following graphs (A, B, C or D) can be used to find the cost of renting a VCR as a function of the number of rental days?



33

Len and Lisa decided to buy a new swimming pool for this year.

They first poured in 500 litres of water. After that they filled it with water at the rate of 3000 litres per hour.

Which one of the following expressions can be used to calculate the number of litres of water there are in the pool after h hours of filling?

A) $f(h) = 500h + 3000$

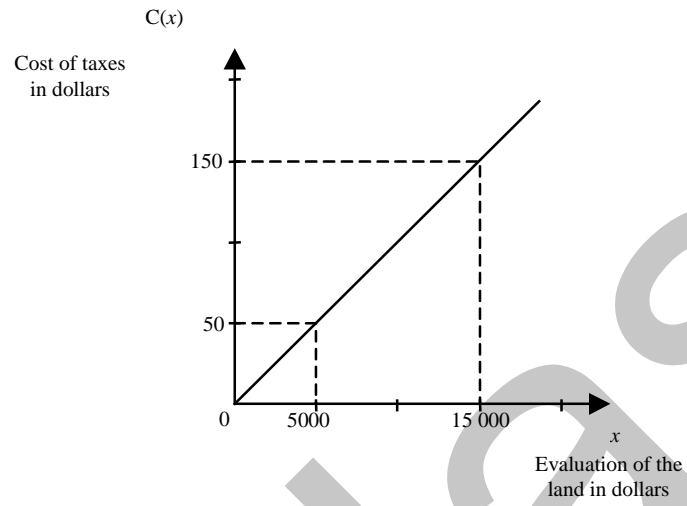
C) $f(h) = 3000h - 500$

B) $f(h) = 3000h$

D) $f(h) = 3000h + 500$

34

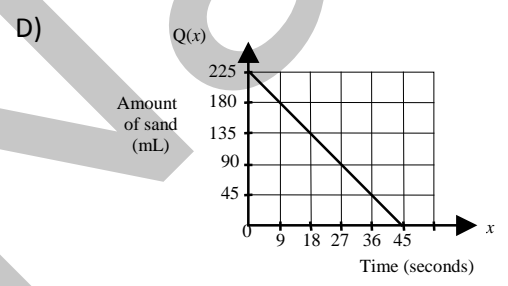
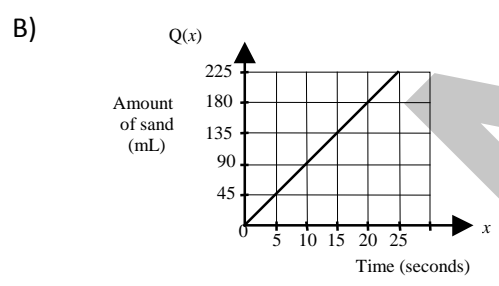
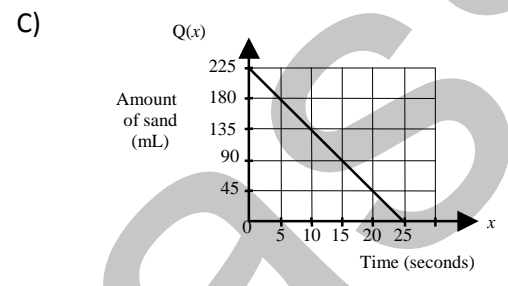
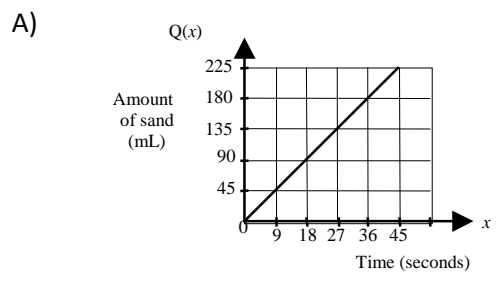
The graph below illustrates the cost of the taxes on a piece of vacant land as a function of its evaluation.



What equation defines this function?

An old-fashioned sand timer contains 225 mL of sand. The sand flows from the top to the bottom at a rate of 9 mL per second.

Which one of the following graphs shows the amount of sand in the bottom of the timer as a function of time?



36

If a motorist is caught for speeding, he must pay a fine of \$10 plus the dollar equivalent of 2 times the number of km/h by which he is over the speed limit.

This situation is represented by the following function :

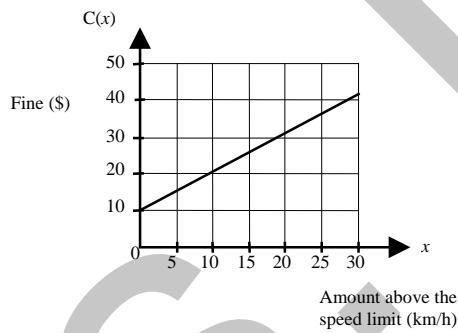
$$C(x) = 10 + 2x$$

$C(x)$ = fine to be paid

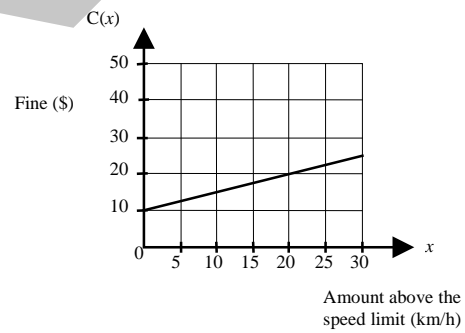
x = number of km/h above the speed limit.

Which one of the following graphs can be used to find the fine to be paid?

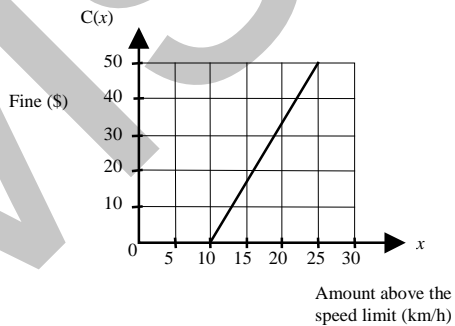
A)



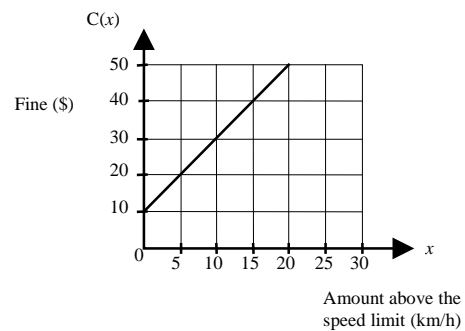
C)



B)



D)



37

A secretary does extra work on weekends to increase her salary. She charges 20 dollars a day plus 2 dollars per page of typing.

This situation is represented by the following function:

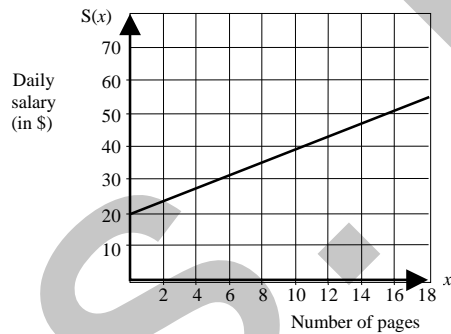
$$S(x) = 20 + 2x$$

$S(x)$ = daily salary

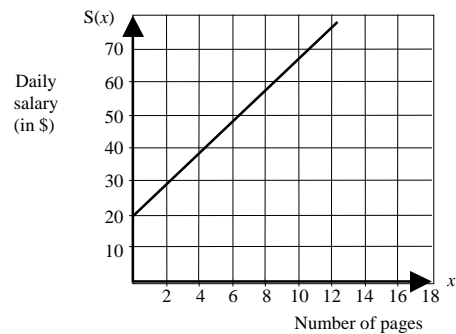
x = number of pages typed

Which one of the following graphs represents her daily salary?

A)

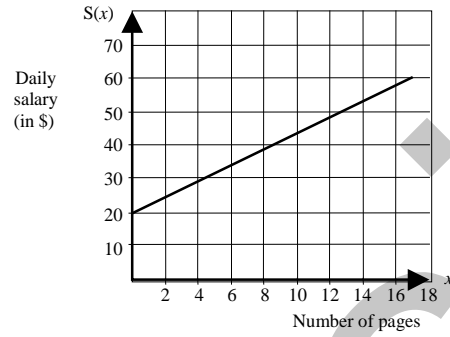
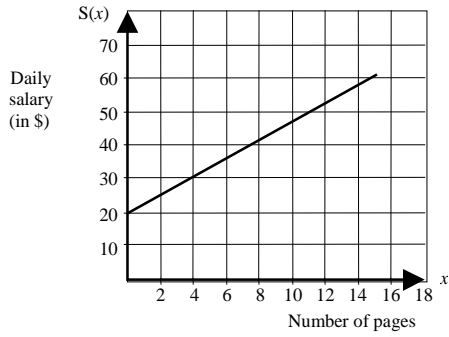


C)



B)

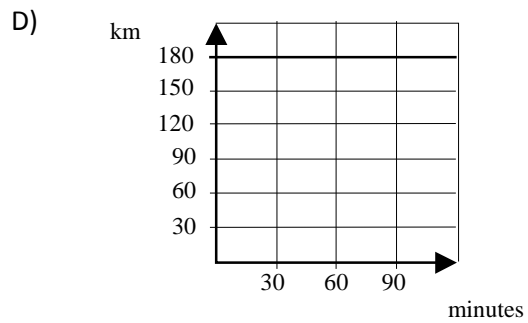
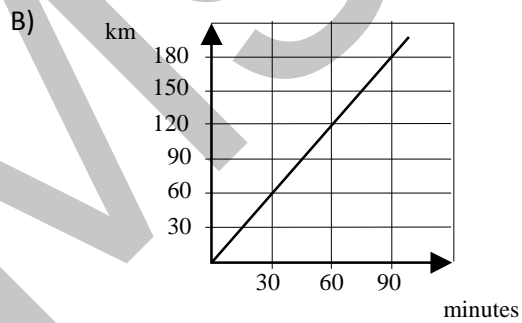
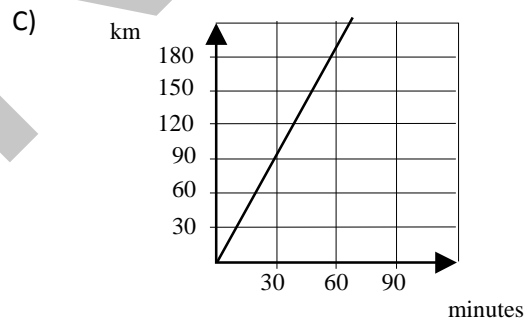
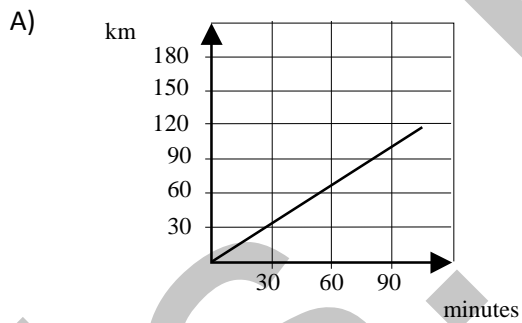
D)



38

A train is travelling at 180 km/hour.

If the train keeps moving at the same speed, which one of the following graphs will allow you to find the distance it has travelled at a given time?



39 A clock slows down at a rate of 1.5 minutes per day. This past Sunday it was 3 minutes slow.

This situation can be represented by the following function:

$$L(t) = 3 + 1.5t$$

where $L(t)$ = the accumulated time lost since Sunday (in minutes)

t = the number of days since Sunday

Draw a graph of the number of minutes of accumulated time lost on the clock since Sunday.

40 The price that a student has to pay for a ticket to the graduation dance depends on the amount of money earned by selling advertisements in the school yearbook. The price of the ticket is determined by the function

$$c(x) = 60 - 0.05x$$

where x = the money from advertising

$c(x)$ = the cost of the ticket

If a student sold \$300 worth of advertising, what will the price of his ticket be?

41

Nathalie cuts lawns during her summer vacation. Her net revenue $r(n)$, in dollars, is calculated using the following function :

$$r(n) = 15n - 105$$

where n : the number of lawns cut.

Nathalie cut 75 lawns last summer.

What was her net revenue?

A) \$1020

C) \$1200

B) \$1125

D) \$1230

42 Michael makes fishing lures which he sells for \$2 each. His production costs are \$26 per week.

This situation is defined by the function

$$p(n) = 2n - 26$$

where $p(n)$: weekly profit

n : number of lures sold

What is the rate of change of this function?

A) 1

C) 13

B) 2

D) 26

43 Three identical pumps, each with a rate of flow of 10 litres per second, are activated simultaneously to empty a reservoir whose capacity is 20 000 litres.

However, this reservoir is only three quarters full.

The number of litres of water left in the reservoir after t seconds have elapsed can be expressed by the function $f(t)$.

Which of the following equations represents this function?

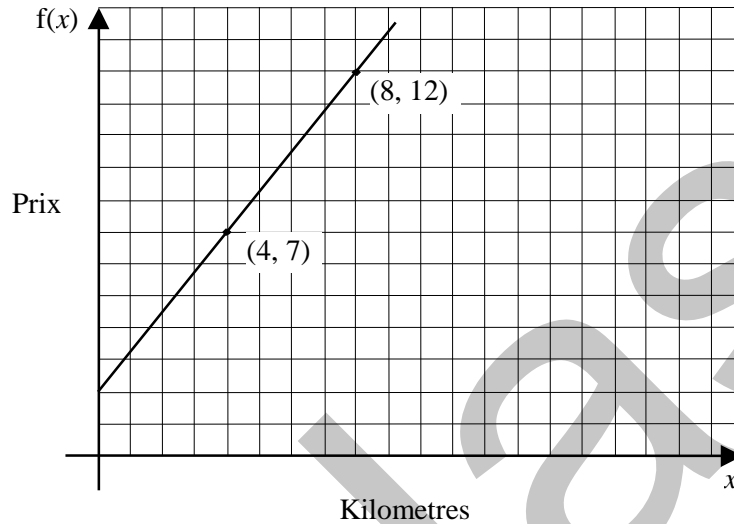
A) $f(t) = 15\,000 - 10t$

C) $f(t) = 20\,000 - 10t$

B) $f(t) = 15\,000 - 30t$

D) $f(t) = 20\,000 - 30t$

- 44 Taxi fares are usually fixed according to the number of kilometres driven. This situation is represented by the graph below.



Which equation can be used to represent this situation?

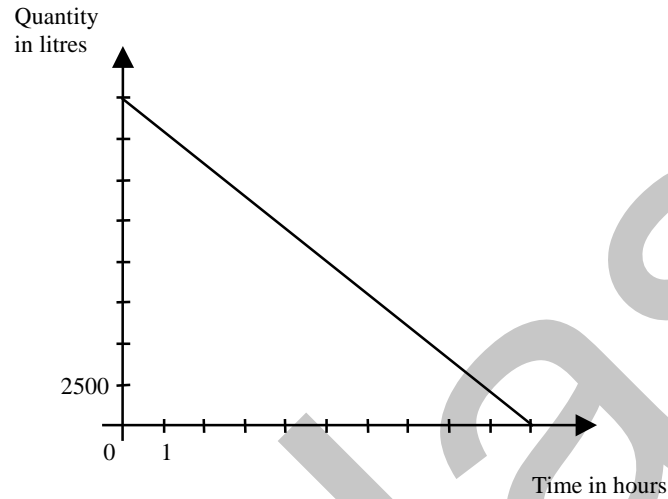
- 45 A car is travelling at a constant speed of 50 km/h. Thus, in 1 hour it travels 50 km, in 2 hours 100 km, etc.

This situation corresponds to the function $f(t)$ where the distance travelled is a function of the elapsed time t .

Graph the function $f(t)$ for the period of time t from 0 to 4 hours inclusively.

46

A pool has to be emptied for repairs. The graph below represents the quantity of water remaining in the pool as a function of the time lapsed since beginning to drain it.



What equation represents the quantity of water $Q(t)$ as a function of time t ?

47

In 1993, a certain car was worth \$18 000. In 1995, the same car was worth only \$13 000. Assuming that the annual rate of change remains the same, how much will this car be worth in 1998?

A) \$8500

C) \$5500

B) \$8000

D) \$3000

48

Lucy and Larry decided to buy a new swimming pool for the summer.

To install the plastic lining, they had to first pour 500 litres of water into the pool. Then they had to fill it with water at a rate of 3000 litres per hour.

Which one of the following expressions will give the number of litres of water in the pool after a number of hours (h)?

A) $f(h) = 500h + 3000$

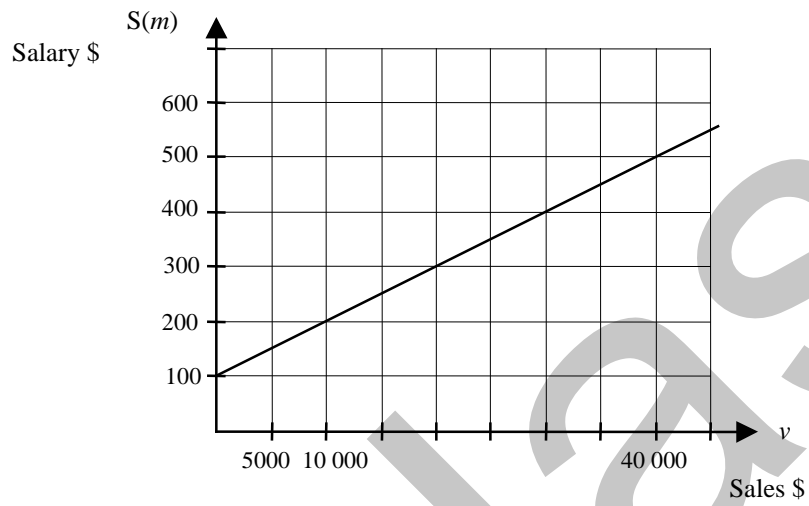
C) $f(h) = 3000h - 500$

B) $f(h) = 3000h$

D) $f(h) = 3000h + 500$

49

The following graph represents the weekly salary of the manager of an automobile dealership $S(m)$ as a function of his sales (s).

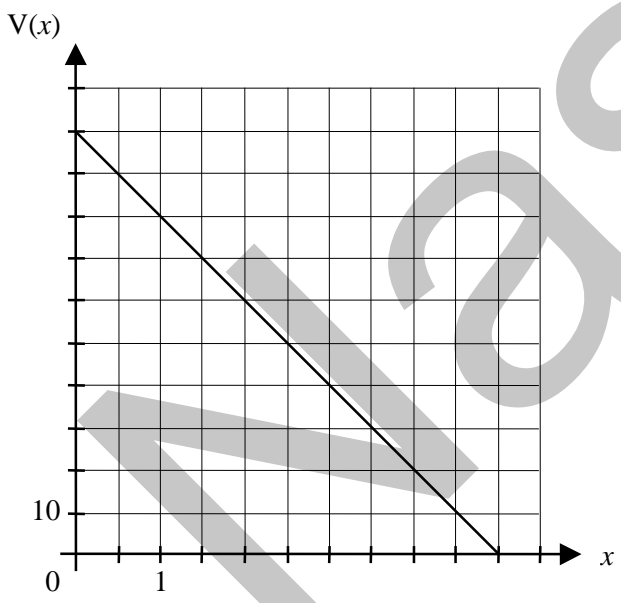


Write the equation to express this function.

50

During experiments on the ABS braking system, engineers discovered that a car's speed decreased at a constant rate.

The graph below represents the number of seconds elapsed (x) after beginning to brake and the corresponding speed $V(x)$ of the car.



Which equation defines the function V ?

A) $V(x) = 20x$

C) $V(x) = 100 + 20x$

B) $V(x) = -20x$

D) $V(x) = 100 - 20x$

51 Line ℓ passes through points $(6, 1)$ and $(-2, 25)$ in the Cartesian plane.

What is the equation of line ℓ ?

52 Find the slope and the x -intercept of the line represented by the following equation:

$$3x - 4y + 24 = 0$$