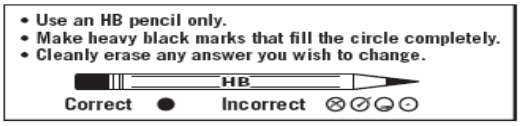
Name: _____

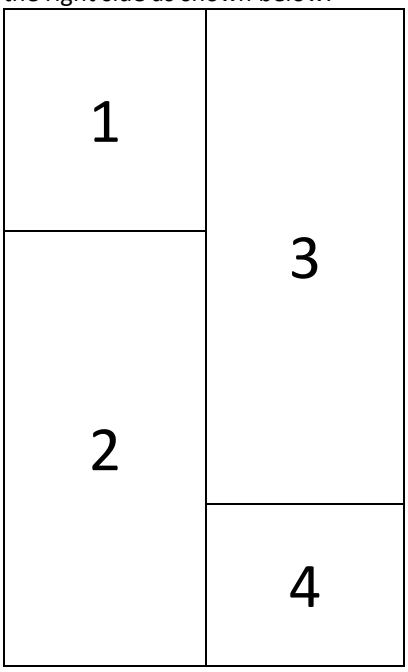
Analysing Linear Relationships

Student Answer Sheet



Use this bubble sheet to answer the multiple choice questions that follow.

Note: questions are numbered down the left side of the page, followed by the right side as shown below:



PLEASE NUMBER THE QUESTIONS AS YOU GO THROUGH

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1

The table below shows examples of linear and non-linear equations.

Equation Examples

Linear equations	Non-linear equations
$y = 5x - 3$	$y = 5x^2 - 3$
$y = 125 - 4.25x$	$y = 2x^3$
$y = -3x$	$2x^2 + 5y^2 = 10$

Which of these statements best describes how linear equations are different from non-linear equations in the table above?

a The exponent of both variables in the linear equations is 1.

b The exponent of exactly one variable in the linear equations is 1.

c The exponent of both variables in the non-linear equations is 1.

d The exponent of exactly one variable in the non-linear equations is 1.

2

Which of the following equations does **not** represent a linear relation?

a $x = -2$

b $y = 3x - 1$

c $y = x^2 + 3$

d $3x - 2y - 1 = 0$

3

Which of the following **cannot** be an equation of a line?

a $x = 2$

b $y = 7$

c $y = 2x^2 + 7$

d $2x + y + 7 = 0$

4

Which of the following equations does **not** represent a line?

a $x = 5$

b $y = 10$

c $xy = 10$

d $5x - y + 10 = 0$

5

Which of the following represents an equation of a line?

a $y = 2^x$

b $y = x^2 - 5$

c $x^2 + y^2 - 25 = 0$

d $2x + 3y - 5 = 0$

6 Which of the following is the equation $4x - 5y + 12 = 0$ in the form $y = mx + b$?

a $y = \frac{4}{5}x + \frac{12}{5}$

b $y = \frac{5}{4}x - 3$

c $y = 4x - 7$

d $y = 5x + 16$

7 Which of the following equations is equivalent to $3x - 5y = 45$?

a $y = \frac{3}{5}x - 9$

b $y = -\frac{3}{5}x + 9$

c $y = 3x - 45$

d $y = -3x + 45$

8 Which equation represents a line that has the same y-intercept as $2x + 3y - 6 = 0$?

a $y = \frac{1}{2}x + 2$

b $y = 2x - 2$

c $y = -\frac{1}{2}x + 6$

d $y = -2x - 6$

9 What are the slope, m, and y-intercept, b, of the line represented by $3x - 2y + 16 = 0$?

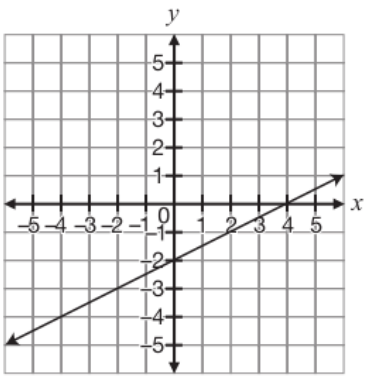
a $m = \frac{3}{2}, b = 8$

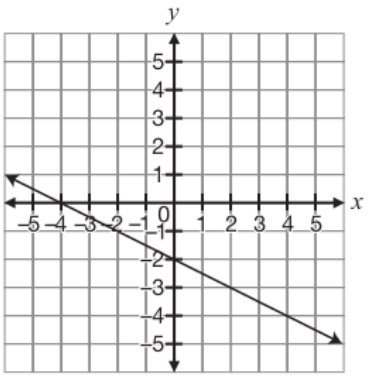
b $m = \frac{2}{3}, b = -16$

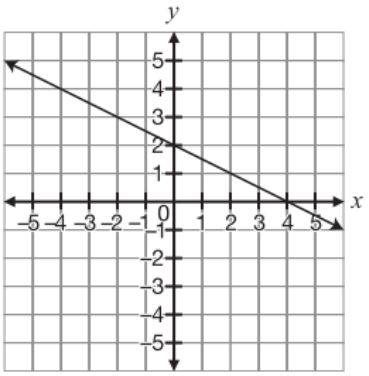
c $m = -\frac{2}{3}, b = -8$

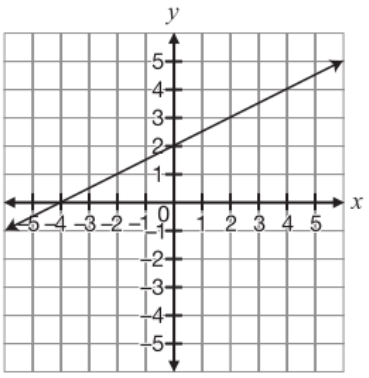
d $m = -\frac{3}{2}, b = 16$

10 Which of the following represents the graph of the equation $2x - 4y = 8$?

a 

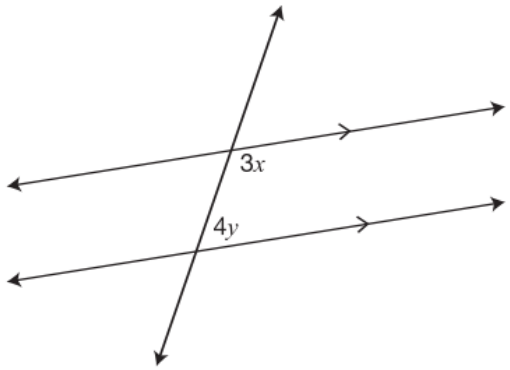
b 

c 

d 

11

The relation shown below can be expressed as $3x + 4y - 180 = 0$.



Another way to write this relation is

a $y = \frac{3}{4}x - 45.$

b $y = -\frac{3}{4}x + 45.$

c $y = -\frac{4}{3}x + 60.$

d $y = \frac{4}{3}x - 60.$

12

Abigail buys a prepaid card for her cellphone. When she talks on her phone, a fee per minute is deducted from the value of the prepaid card.

The table below shows information about the remaining value of the card.

Total number of minutes used, t	Remaining value, V ($)
10	22.00
20	19.00

Which equation represents the relationship between the remaining value and total number of minutes used?

a $V = 22 - 3t$

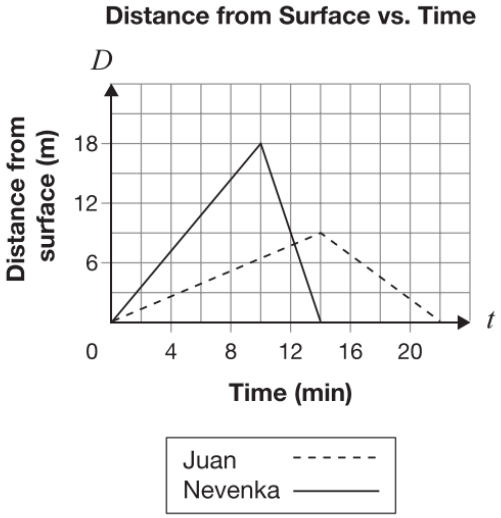
b $V = 22 - 0.30t$

c $V = 25 - 3t$

d $V = 25 - 0.30t$

13

Nevenka and Juan scuba dive. The graph below represents the relationship between the distance from the surface, in metres, and time, in minutes, for both divers as they swim down from the surface and then swim back up.



Which statement below is true?

a Juan swims back up at a rate of 0.5 m/min.

b Nevenka swims back up at a rate of 4.5 m/min.

c Nevenka swims down faster than she swims back up.

d Juan swims down and back up at the same rate.

14

The total cost of swimming at a community swimming pool is made up of a membership fee and a cost per swim.

At this community centre, Jake pays a total of $100 and swims 40 times. Paula pays a total of $70 and swims 25 times.

Which of the following statements is true?

a The membership fee is $20.

b The membership fee is $30.

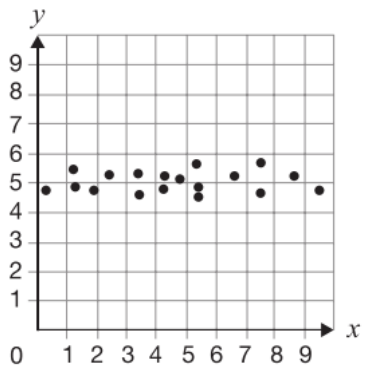
c The cost per swim is $2.50.

d The cost per swim is $2.80.

15

For which scatter plot could the line $y = 5$ be the line of best fit?

a



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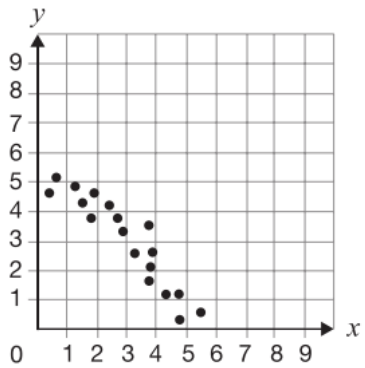

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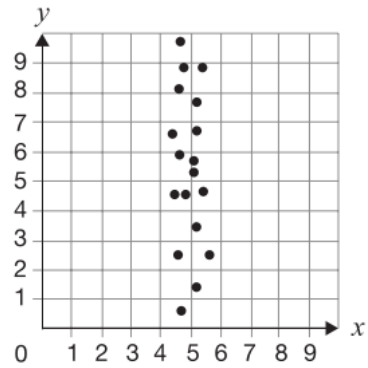

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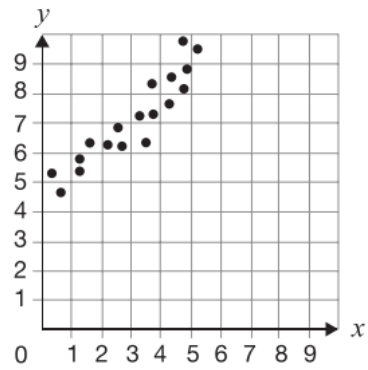
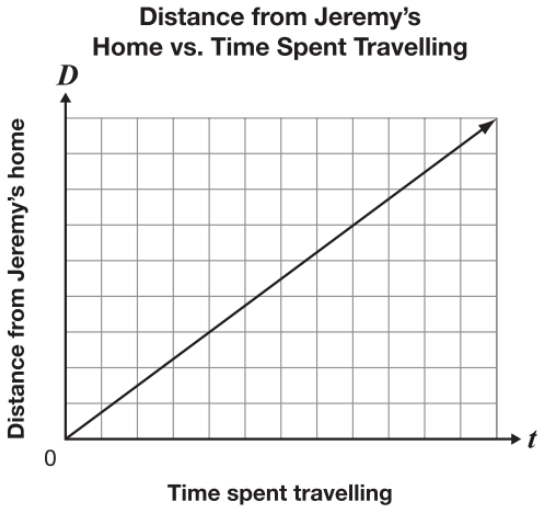


16

Last weekend, Jeremy travelled from his home to a friend's house. The graph below represents the relation between D, the distance from Jeremy's home, and t, the time spent travelling to his friend's house.



This weekend, Jeremy travels to his friend's house but leaves from school. Jeremy's school is between his house and his friend's house.

If he travels at a faster rate this weekend, how will the line representing this trip compare to the line representing the previous trip?

This new line will

a start at a higher point and be steeper.

b start at a higher point and be less steep.

c start at the current point and be steeper.

d start at the current point and be less steep.

17

Consider the equation $y = mx + 5$.

If (7, 3) is a point on the line represented by this equation, which of the following is true?

a The rise is 8 when the run is 7.

b The rise is 7 when the run is 8.

c The rise is -2 when the run is 7.

d The rise is 7 when the run is -2.

18

A local fair charges a $15 entry fee and $1.75 per ride. Dustin has $35 to spend.

What is the maximum number of rides Dustin can go on?

a 8

b 11

c 12

d 20

19

Alex has $150. She spends the same amount each week. After 6 weeks, she has $30 remaining.

The relationship between the amount of money Alex has and the number of weeks is represented by a line. What is the slope of this line?

a −25

b −20

c 20

d 25

20

Janelle draws a line that passes through the points (−1, 6) and (0, 3). If Janelle writes the equation of the line in $y = mx + b$ form, what are the values of m and b?

a $m = -9$, $b = 3$

b $m = -3$, $b = 6$

c $m = -9$, $b = 6$

d $m = -3$, $b = 3$

21

In the relation $C = 60 + 15n$, C represents the total cost of holding an event at a hall, and n represents the number of guests.

The maximum number of guests allowed in the hall is 100.

What are the minimum and maximum possible values for C?

a $0, $1500

b $0, $1560

c $60, $1500

d $60, $1560

22

The total cost of hiring Beth's Plumbing Services is represented by the equation $C = 50t + 70$, where C is the total cost in dollars and t is the time in hours.

Next month, the rate will change to $60 per hour, but the initial charge will stay the same.

Which of the following describes how the graph of the relation will change?

a The steepness of the line will increase.

b The steepness of the line will decrease.

c The vertical intercept will increase by 10 units.

d The vertical intercept will decrease by 10 units.

23

Which equation below represents a line that is perpendicular to the line represented by $y = 3x - 5$?

a $y = 3x + \frac{1}{5}$

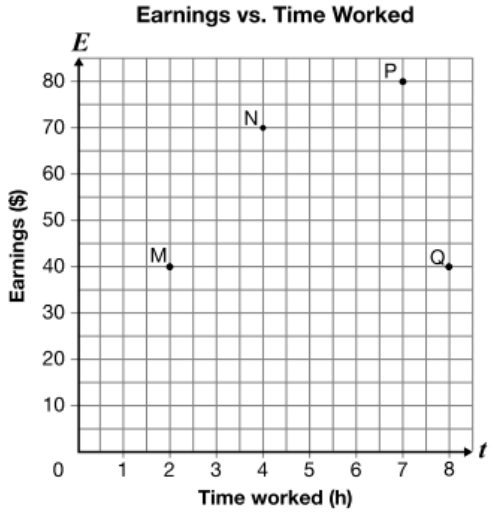
b $y = -3x - \frac{1}{5}$

c $y = -\frac{1}{3}x + 7$

d $y = \frac{1}{3}x - 7$

24

The graph below represents the relationship between earnings and time worked.



Which of the following points represents the highest rate of pay?

a M

b N

c P

d Q

25

Gerry has a table of values representing a linear relation. Two of the numbers are hidden behind a ketchup spill.

x	y
−2	−6
−1	
0	
1	18

The values that are hidden are

a −2 and 14.

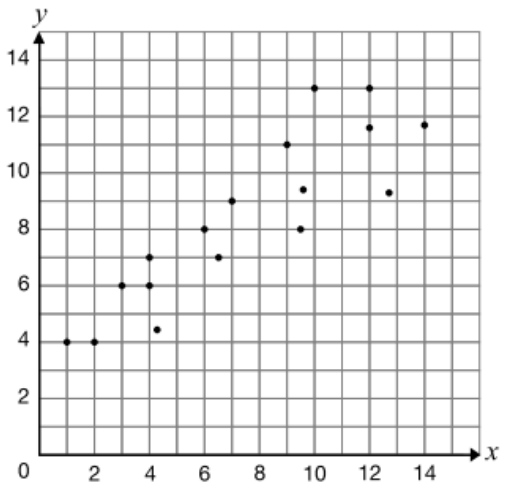
b 0 and 12.

c 2 and 10.

d 3 and 9.

26

Which of the following could be the slope of a line of best fit for the data shown in the scatter plot below?



a −2

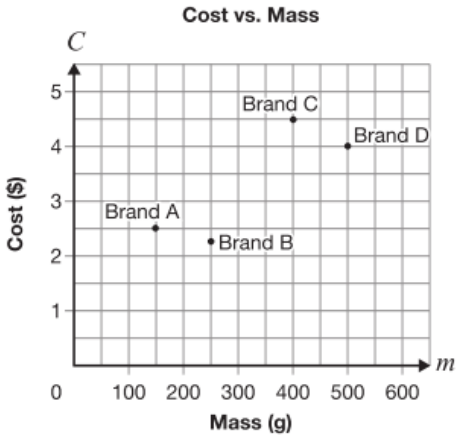
b −1

c 1

d 2

27

The following graph shows the relationship between the mass and the cost of four different brands of strawberry jam.



Which statement is true?

a Brand A has the lowest cost.

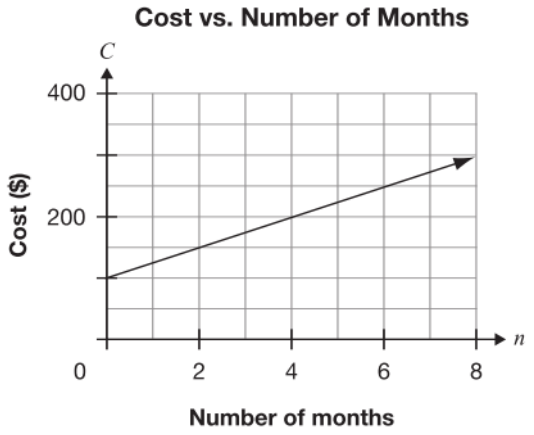
b Brand B has the smallest mass.

c Brand C has the highest cost per gram.

d Brand D has the lowest cost per gram.

28

The graph below represents the cost to belong to a local gym.



Which equation represents the graph?

a $C = \frac{1}{25}n + 100$

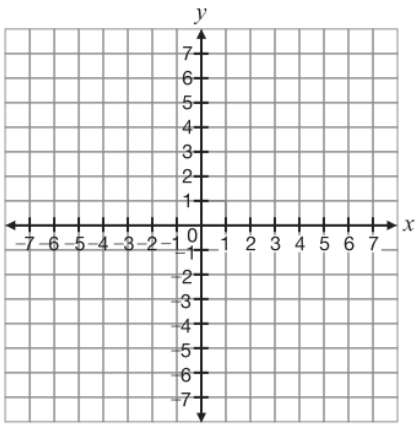
b $C = \frac{1}{2}n + 100$

c $C = 2n + 100$

d $C = 25n + 100$

29

Consider the points A(1, 4), B(6, 3), C(−1, 5), D(−3, 0) and E(2, −1).



Which line segment is parallel to AB?

a AE

b BE

c CE

d DE

30

How would the graph of the relation $y = 3x - 2$ change if the 3 and −2 were both doubled?

The graph would be

a steeper and have a lower y-intercept.

b steeper and have a higher y-intercept.

c less steep and have a lower y-intercept.

d less steep and have a higher y-intercept.

31

The equations below represent the relationship between the total cost, C, in dollars, to repair a computer and the amount of time, t, in hours, at two computer repair stores.

Compu-Fix: $C = 10 + 15t$

Data Repair: $C = 30 + 12t$

It will take between 1 and 5 hours to repair Maria's computer.

What are the smallest and largest possible amounts Maria could pay?

a $10, $85

b $10, $90

c $25, $85

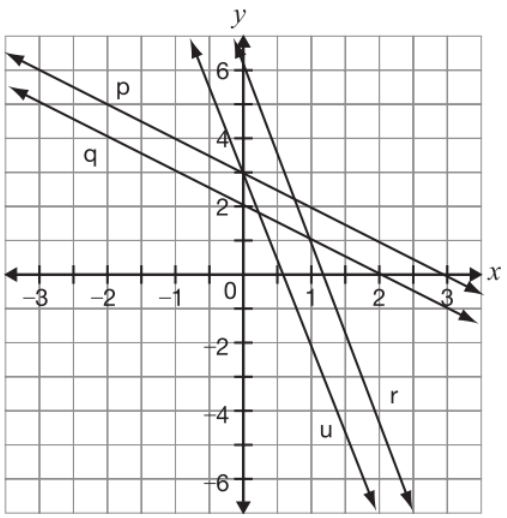
d $25, $90

32

Lee thinks of a line represented by the equation $y = -4x + 6$.

Which line on the graph below is

- steeper than Lee's line and
- has a y-intercept that has half the value of Lee's line?



a p

b q

c r

d u

33

A line has a y-intercept of 4 and a slope of -3.

Which equation represents this line?

a $y = 4x + 3$

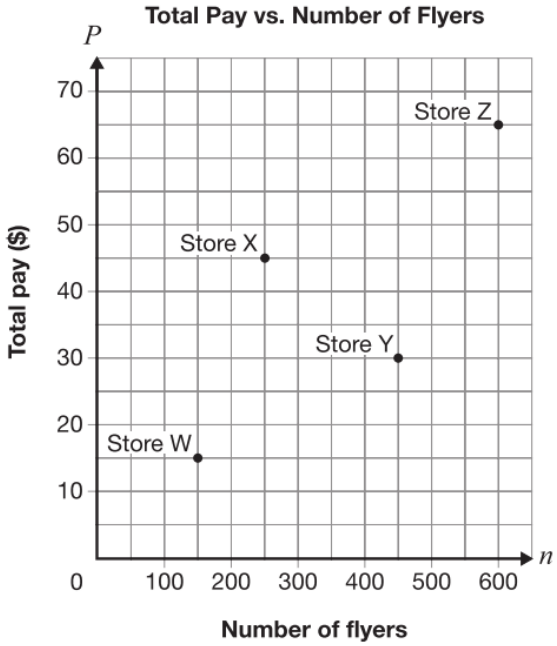
b $y = 4x - 3$

c $y = 4 + 3x$

d $y = 4 - 3x$

34

Four stores hire people to deliver flyers. Each pays a different amount per flyer delivered. The points on the graph below show the total pay for a certain number of flyers delivered for each of the stores.



Which store will pay $45 for 450 flyers delivered?

a Store W

b Store X

c Store Y

d Store Z

35

A formula for determining the slope of a line is given below.

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

What is the slope of the line that passes through the points (2, 3) and (5, −6)?

a -11

b -3

c $-\frac{1}{3}$

d $-\frac{1}{11}$