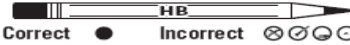


Name: _____

Modelling with Graphs and Basic Linear Relations

Student Answer Sheet

- Use an HB pencil only.
- Make heavy black marks that fill the circle completely.
- Cleanly erase any answer you wish to change.



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

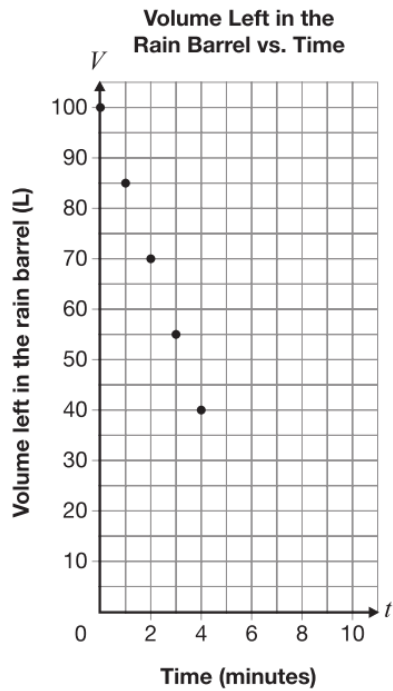
Note: questions are numbered down the left side of the page, followed by the right side as shown below:

1	3
2	
	4

1. A B C D
2. A B C D
3. A B C D
4. A B C D
5. A B C D
6. A B C D
7. A B C D
8. A B C D
9. A B C D
10. A B C D
11. A B C D
12. A B C D
13. A B C D
14. A B C D
15. A B C D
16. A B C D
17. A B C D
18. A B C D
19. A B C D
20. A B C D
21. A B C D
22. A B C D
23. A B C D
24. A B C D
25. A B C D

①

A rain barrel full of water is drained at a constant rate. Data for the first few minutes of draining is shown on the grid below.



After 6 minutes, the draining is stopped.

How much water is needed to refill the rain barrel?

- a 90 L
- b 75 L
- c 25 L
- d 10 L

②

The figures below are made with sticks of equal length. Figure 1 is made with 4 sticks.

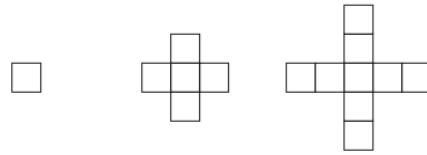


Figure 1

Figure 2

Figure 3

The pattern continues in the same way. Which table shows the relationship between the number of sticks, S , and the figure number, n ?

a

n	S
1	4
2	20
3	36

b

n	S
4	40
5	52
6	64

c

n	S
3	12
4	16
5	20

d

n	S
5	17
6	21
7	25

3

Luisa chooses a cellphone plan that charges a flat fee of \$20 per month and \$0.25 for each text message sent.

Which equation best represents the cost of Luisa's cellphone plan, C , in dollars, where n is the number of text messages sent?

- a $C = 20.25n$
- b $C = 20(0.25n)$
- c $C = 20n + 0.25$
- d $C = 0.25n + 20$

6

Alex's distance from home is represented by the equation $D = -0.5t + 300$, where D represents his distance from home, in kilometres, and t represents time, in minutes.

How long will it take Alex to reach a distance of 182 km from home?

- a 236 minutes
- b 209 minutes
- c 64 minutes
- d 59 minutes

4

There is a linear relationship between the total cost of renting a costume and the number of hours the costume is rented.

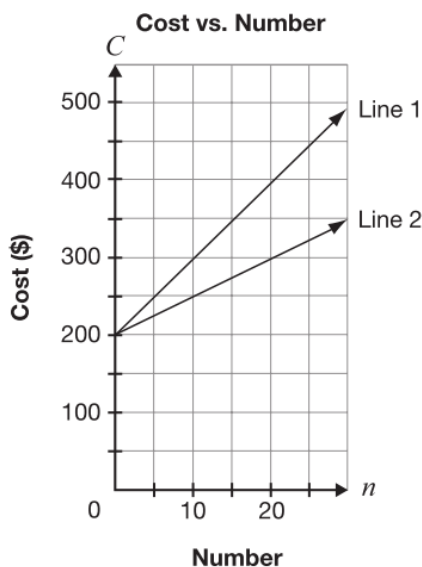
- For 3 hours, the total cost is \$60.
- For 5 hours, the total cost is \$80.

What type of variation is this relationship, and what is its initial value?

- a a partial variation with an initial value of \$30
- b a partial variation with an initial value of \$20
- c a direct variation with an initial value of \$30
- d a direct variation with an initial value of \$20

7

Two lines are shown below.



Which of the following describes a difference between Line 1 and Line 2?

- a Line 2 has a larger initial cost.
- b Line 1 has a larger initial cost.
- c Line 2 has a greater rate of change.
- d Line 1 has a greater rate of change.

5

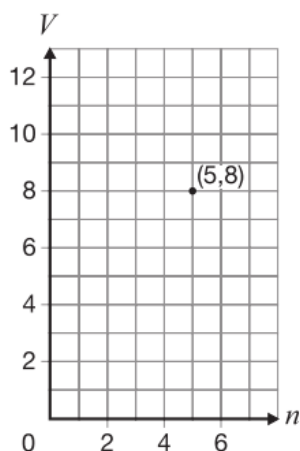
A bus is rented for a class field trip. The transportation cost for the trip is made up of \$225 to rent the bus, \$50 for gas and \$2 for each bus seat.

Which relation below describes the total transportation cost for the trip if C is the total cost in dollars and n is the number of seats?

- a $C = -2n + 225$
- b $C = -2n + 275$
- c $C = 2n + 225$
- d $C = 2n + 275$

8

The point on the grid below belongs to a linear relation that has $-\frac{3}{2}$ as its rate of change.



Which of the following points also belongs to this relation?

- a (2,6)
- b (2,10)
- c (3,11)
- d (7,11)

9

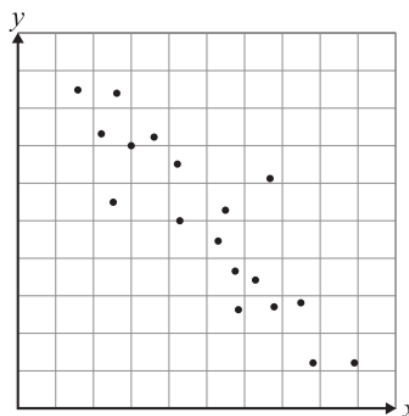
Liam sells sandwiches at an arena. He earns \$10.50 per hour plus \$0.40 for each sandwich he sells.

How many sandwiches does he need to sell during a 6-hour shift to earn \$125?

- a 158
- b 155
- c 62
- d 12

10

Consider the graph below.



Which relationship is most likely to be represented by this graph?

- a height vs. weight
- b pay vs. number of hours worked
- c gas remaining vs. distance travelled
- d volume of water in a bucket vs. its mass

11

Which relation does **not** have an initial value of 50?

- a $y = 50$
- b $y = 50 + 8x$
- c $y = 50x$
- d $y = 50 - x$

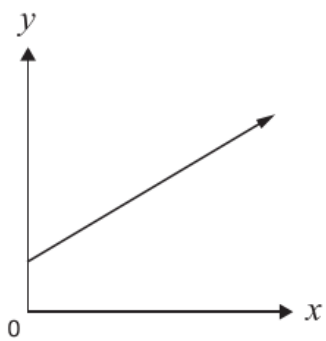
12

Which of the following represents a non-linear relation?

a

x	y
1	1
2	4
3	9
4	16

b



c

$$y = 2x + 3$$

d

x	y
4	8
3	5
2	2
1	-1

13

Which table of values shows a linear relation between C and n ?

a

n	C
0	0
1	2
2	4
3	8

b

n	C
0	0
1	1
2	4
3	9

c

n	C
0	0
1	4
2	11
3	15

d

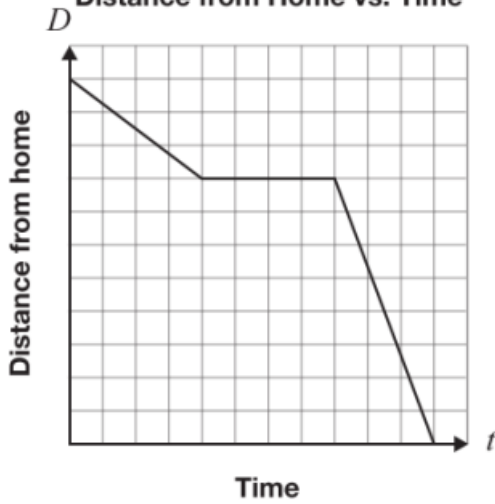
n	C
0	0
1	3
2	6
3	9

14

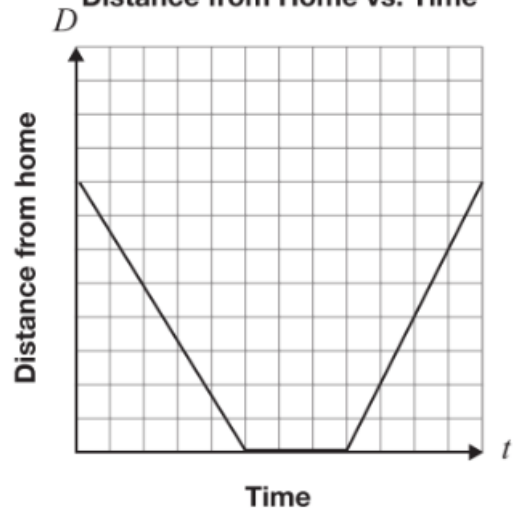
Bruno leaves home and goes for a run along a straight path. He runs to the park, stops for a rest and returns home.

Which graph best represents his run?

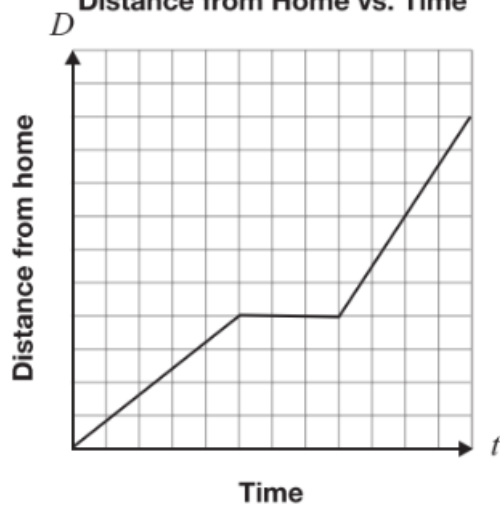
a Distance from Home vs. Time



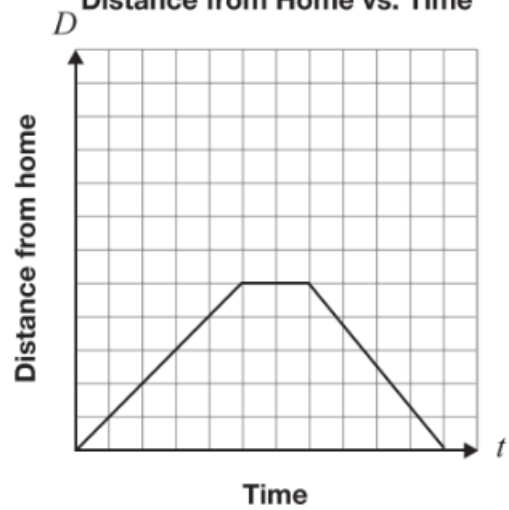
c Distance from Home vs. Time



b Distance from Home vs. Time

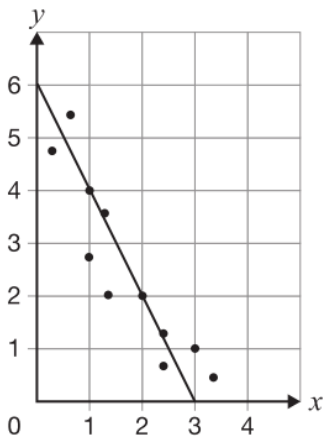


d Distance from Home vs. Time



15

A line of best fit is drawn on the scatter plot below.



The slope of the line is -2 .

Which equation represents the line?

- a $y = 6x - 2$
- b $y = 3x - 2$
- c $y = -2x + 3$
- d $y = -2x + 6$

16

Karina has a job at a video store. The total she is paid each week is made up of an hourly rate plus \$14 for transportation.

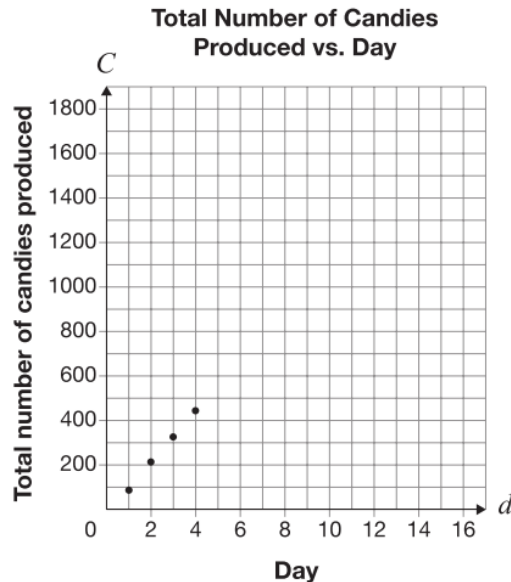
One week, she works 20 hours and is paid \$215.

Which equation represents the relationship between Karina's total pay, P , in dollars, and the number of hours she works, n ?

- a $P = 10.75n + 14$
- b $P = 14n + 10.75$
- c $P = 10.05n + 14$
- d $P = 14n + 10.05$

17

Dechen has a candy-making business. The graph below shows the total number of candies his business has produced by the end of each day for the first four days.

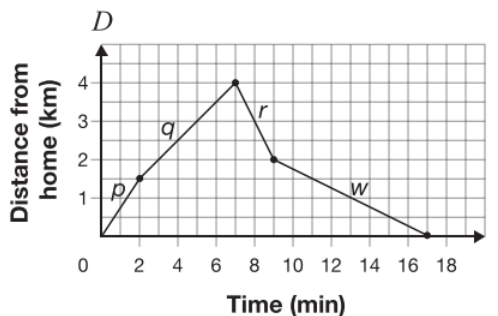


If this trend continues, which of the following points represents a day with more candies produced than expected?

- a (5, 500)
- b (9, 850)
- c (10, 1300)
- d (14, 1400)

18

The graph below represents the relationship between Rena's distance from home and time.



During which section of the graph does Rena travel the fastest?

- a p
- b q
- c r
- d w

19

The table below represents a linear relation.

Time, t	Distance, D
0	5
1	15
2	25
3	35
4	45

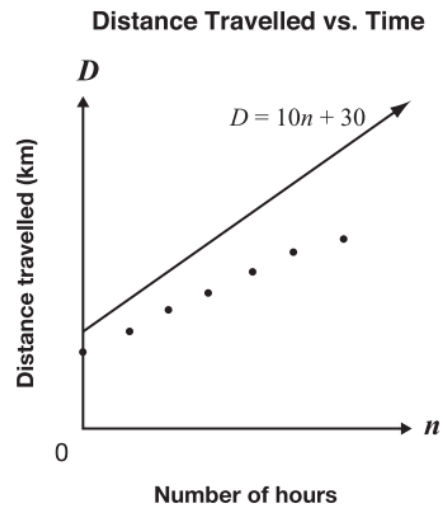
Which equation represents this relation?

- a $D = 5t$
- b $D = 10t$
- c $D = 10t + 5$
- d $D = 5t + 10$

20

Data on distance travelled and the number of hours spent travelling are shown on the graph below.

The line $D = 10n + 30$ is also shown on the graph.



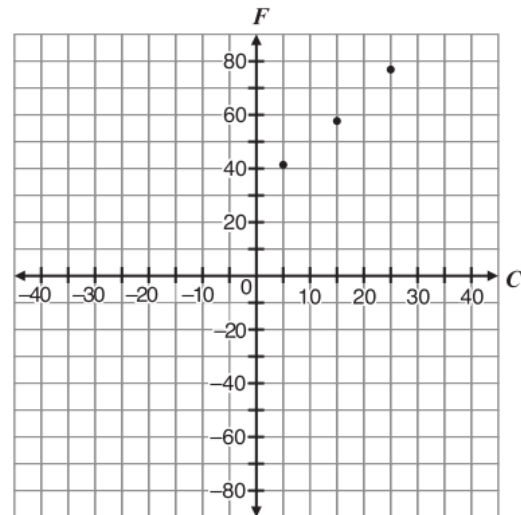
Which equation best represents the line of best fit for the data shown?

- a $D = 5n + 33$
- b $D = 8n + 23$
- c $D = 10n + 18$
- d $D = 12n + 25$

21

Consider the following chart and graph.

Temperature in degrees Celsius, C	Temperature in degrees Fahrenheit, F
5°	41°
15°	59°
25°	77°



What temperature in degrees Celsius is equivalent to -20°F ?

- a -4°C
- b -18°C
- c -29°C
- d -40°C

22

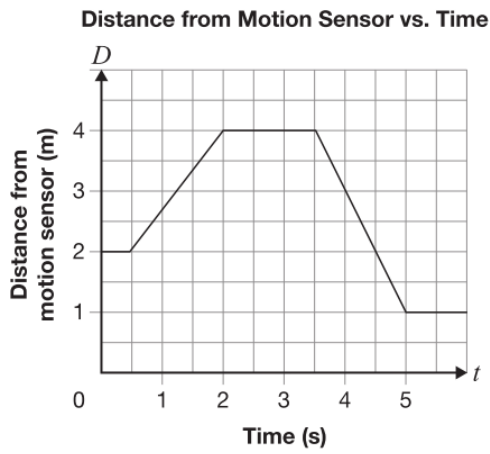
A sports company uses the equation $C = 8t + 5$ to represent the relationship between the total amount charged to rent a canoe, C , in dollars and the rental time, t , in hours.

What is the initial charge to rent a canoe?

- a \$0
- b \$5
- c \$8
- d \$13

23

Tyler walks along a line leading from a motion sensor. The graph below shows information about Tyler's walk.

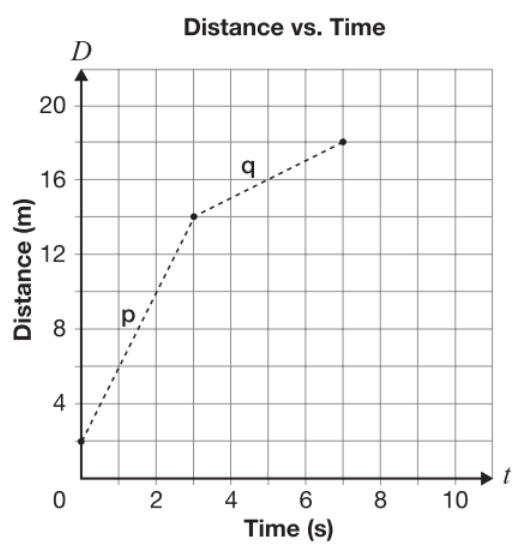


Which of the following is closest to Tyler's speed in metres per second as he walks toward the motion sensor?

- a 2.0
- b 1.3
- c 0.8
- d 0.5

24

The graph below represents the relationship between distance and time on Javier's walk.



How much greater is Javier's speed in section p than in section q?

- a 0.5 m/s
- b 1.5 m/s
- c 2.0 m/s
- d 3.0 m/s

25

Which graph represents the equation

$$P = -\frac{1}{2}n + 5$$

