

Answers Relationships

1.

The relationship between the distance, d , in kilometres, travelled by a person on a bicycle and the time, t , in hours, is described in two ways:

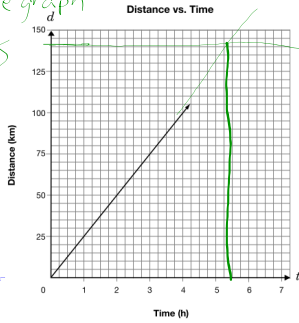
- The equation is $d = 25t$.
- The graph is shown below.



Determine the time it will take to travel 140 km.
Show your work.

① Way - use graph
~ 5.5 hours

② Equation
 $d = 25t$
 $140 = 25t$
 $\frac{140}{25} = \frac{25t}{25}$
 $5.6 = t$
Which is more accurate?

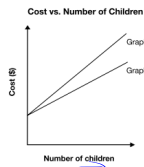


2.

Amina is going to take some children to the zoo or to the museum.

The following equations represent the total cost of each trip, where C is the total cost, in dollars, and n is the number of children.

A trip to the zoo	$C = 5n + 8$
A trip to the museum	$C = 4n + 8$



Which graph represents the total cost of a trip to the zoo?

Circle one: Graph A or Graph B

Give reasons for your choice.

zoo
museum
zoo slope = 5
museum slope = 4
- steeper slope equals larger number and is steeper

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3.

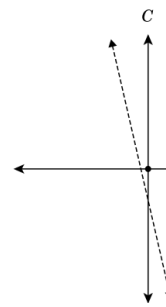
Veza uses the equation $C = 43n + 50$ to model the cost of soccer shirts for the team, where C represents the total cost in dollars, and n represents the number of soccer shirts.



Veza sketches the graph of this relationship.

Explain why the graph shown cannot represent the total cost of soccer shirts.

List at least two reasons.

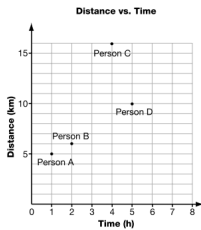


① slope $C = 43n + 50$
 $m = +43$
the graph has a negative slope
② Initial cost is \$50. The graph's initial value is negative

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4.

The graph below shows the distance travelled by four people in a walkathon and the time they take.

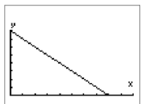


Which person walks at the greatest average speed?

- A Person A $\frac{5}{1} = 5$
- B Person B $\frac{6}{2} = 3$
- C Person C $\frac{15}{3} = 5$
- D Person D $\frac{10}{4} = 2.5$

6.

Study the display on Marie's graphing calculator.



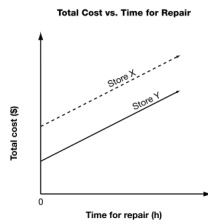
Which statement describes the relation between x and y ?

- a y increases linearly as x increases.
- b y decreases linearly as x increases.
- c y increases non-linearly as x increases.
- d y decreases non-linearly as x increases.

5.

Two bicycle repair stores charge an initial fee and an hourly rate for repairs.

The graph below shows the total cost of repairs versus time for the repair.



Which statement is true?

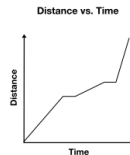
Which statement is true?

F The two stores charge different hourly rates and the same initial fee.

- G The two stores charge the same hourly rate and different initial fees.
- H The two stores charge different hourly rates and different initial fees.
- J The two stores charge the same hourly rate and the same initial fee.

7.

The graph below shows a runner's distance from the starting point of a race over time.



The runner

- a ran at 2 different speeds and took 3 breaks.
- b ran at 3 different speeds and took 2 breaks.
- c always ran at the same speed and took 2 breaks.
- d ran at 5 different speeds.

9. Kaya works as a translator. She charges 21¢ for each word she translates.

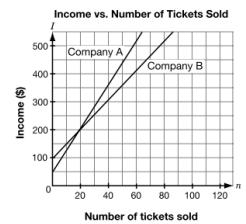


Which expression should Kaya use to calculate her charge, in dollars, for translating a document with n words?

- a $\$ \frac{21 \times n}{100}$
- b $\$ \frac{100}{21 \times n}$
- c $\$ \frac{n}{21 \times 100}$
- d $\$ \frac{21 \times 100}{n}$

8.

High school theatre companies earn their income through start-up grants and ticket sales. The graph shows the relationship between income, I , in dollars and number of tickets sold, n .



Which statement is true, given the information shown on the graph?

- A Company A always had more income than Company B.
- B The two companies had the same income when 40 tickets were sold.
- C Company A got a larger start-up grant than Company B.
- D Company A charged more per ticket than Company B.

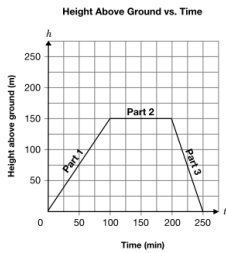
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Answers Relationships

10. Terri is a rock climber.

The graph below shows the relationship between her height in metres above the ground and the time in minutes she spends climbing.

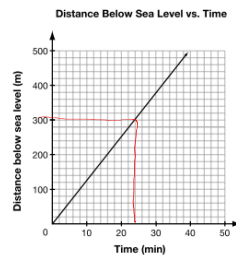


In the table below, describe Terri's climb.

Section of graph	Description
Part 1	- speed = $\frac{150}{100} = 1.5$ m/min - up the hill for 100 minutes
Part 2	- rested for 100 minutes - speed = 0 m/min - top of hill 150m
Part 3	- down the hill in 50 minutes - speed of $\frac{150}{50} = 3$ m/min which was faster than climbing up

Hint: Use words like
• direction
• distance
• time
• speed

11. A submarine is submerging. The graph shows the distance below sea level the submarine has descended over time.



How far below sea level has the submarine descended after 24 min?

- a 300 m
b 325 m
c 350 m
d 375 m

12. Sergio sells 7 models of CD players. The table shows the unit cost of each model and the number of CD players of that model sold in the past month.

Model	Unit cost (\$)	Number sold
A	55	11
B	70	14
C	90	17
D	100	21
E	120	24
F	150	29
G	200	41

Which statement about the relationship between the unit cost and the number of CD players sold is true?

- a There is no relationship between the unit cost and the number sold.
b As the unit cost increases, the number sold decreases.
c As the unit cost increases, the number sold is constant.
d As the unit cost increases, the number sold increases.

13. Natasha works for a computer company. The table shows her annual salary in the last five years.

Year	Annual salary (\$)
1	32 000
2	33 600
3	35 200
4	36 800
5	38 400

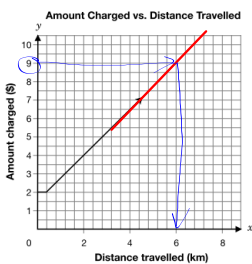
If the trend continues, what will Natasha's annual salary be in the 8th year?

- a \$40 000
b \$43 200
c \$46 400
d \$49 600

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13. The graph below shows the relationship between how much a taxi company charges for a ride and the distance travelled.



How far has a customer travelled if the charge for the ride is \$9?

- a 4.8 km
b 5.2 km
c 5.8 km
d 6.0 km

15. Sergio sells 7 models of CD players. The table shows the unit cost of each model and the number of CD players of that model sold in the past month.

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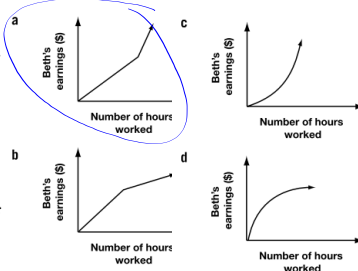
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16. Beth works at a grocery store. She earns \$8/h for her first 20 h of work in a week. She earns \$11/h for working beyond 20 h a week.



Which graph shows the relationship between Beth's earnings and the number of hours she works in a week?



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17. Nadia lives 11.4 km from school and rides her bike to school every day. The equation $d = 11.4 - 0.6t$ represents the relationship between d , her distance from school in km, and t , her time spent travelling in minutes. If she leaves home at 8:05 a.m., what time will she get to school?

- a 8:11 a.m.
b 8:16 a.m.
c 8:17 a.m.
d 8:24 a.m.

19. Identical bottles are packed in a box. The box will hold a maximum of 38 bottles. The relationship between M , the total mass of the box and its contents, and n , the number of bottles in the box, is represented by the equation $M = 500n + 800$.

Which of the following are possible integer values for the variable n ?

- a n is greater than 37.
b n is greater than or equal to 0.
c n is greater than 0 but less than 39.
d n is greater than or equal to 0 but less than 39.

18. Natasha works for a computer company. The table shows her annual salary in the last five years.

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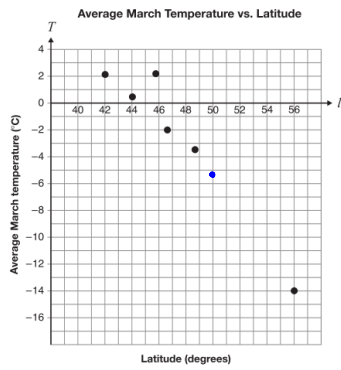
If the trend continues, what will Natasha's annual salary be in the 8th year?

- a \$40 000
b \$43 200
c \$46 400
d \$49 600

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Answers Relationships

20. The average March temperatures for six Ontario communities are plotted according to their latitudes on the following scatter plot.



The city of Kenora has a latitude of 50° and has an average March temperature of -5.3 °C.
Does the community of Kenora follow the trend of the data?
Justify your answer.

Yes, ...

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