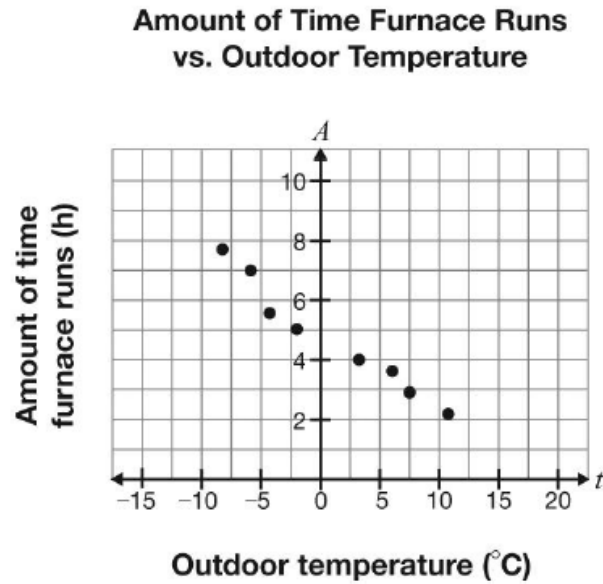


# 2018 EQAO Grade 9 Sample Test

Linear Relationships Questions

4. One winter, Cassy records the total amount of time,  $A$ , in hours, that her furnace runs in a day versus the outdoor temperature,  $t$ , in degrees Celsius. She produces this scatter plot.



Cassy then decides to improve the insulation in her home, which will save energy and reduce the amount of time her furnace runs.

Which point could Cassy expect to record **after** improving the insulation in her home?

- a.  $(-5, 10)$
- b.  $(0, 5)$
- c.  $(5, 2)$
- d.  $(10, 5)$

6. An amusement park charges an entrance fee and a cost per ride as shown in the table.

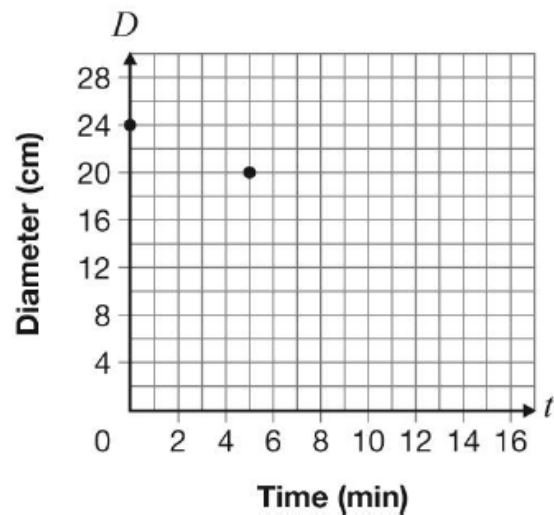
Number of rides	Total cost (\$)
3	15
9	27

The park decides to reduce its entrance fee by \$5.

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

- a. a partial variation with an initial value of \$4
- b. a direct variation with an initial value of \$2
- c. a partial variation with an initial value of \$9
- d. a direct variation with an initial value of \$0

7. A class measures the diameter of a snowball as it melts. Information about the diameter at two different times is shown on the grid below.



If this situation is modelled as a linear relationship using the two points, what is the **total time** it will take the snowball to melt completely?

- a. 30 minutes
- b. 24 minutes
- c. 20 minutes
- d. 16 minutes

14. Which of the following does **not** represent a straight line?

a.  $y = 2$

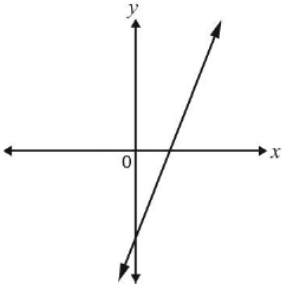
b.  $x = 2$

c.  $x = 2y$

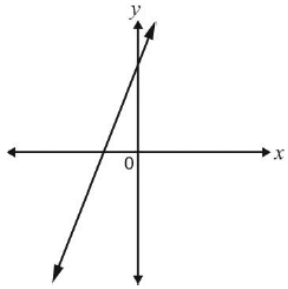
d.  $y = x^2$

15. Which of these graphs could represent  $y = 5 - 2x$ ?

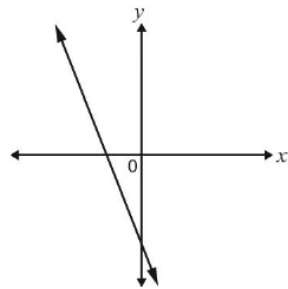
a.



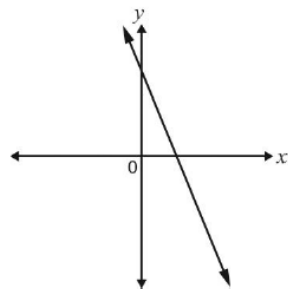
b.



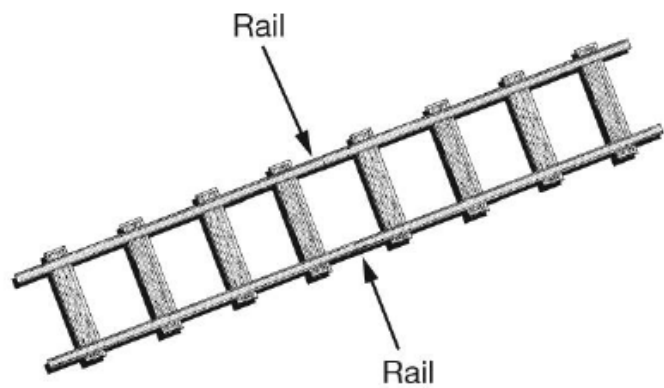
c.



d.



16. The path of one of the rails of a train track can be represented by the equation  $y = \frac{2}{3}x + 1$ .

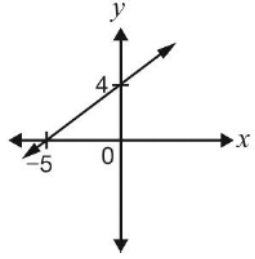


Which equation could represent the path of the second rail?

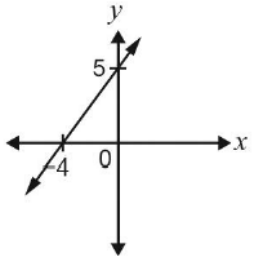
- a.  $y = -\frac{3}{2}x + 3$
- b.  $y = -\frac{2}{3}x + 3$
- c.  $y = \frac{2}{3}x + 3$
- d.  $y = \frac{3}{2}x + 3$

17. Using the  $x$ - and  $y$ -intercepts, select the graph that represents  $4x - 5y = -20$ .

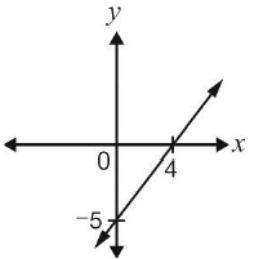
a.



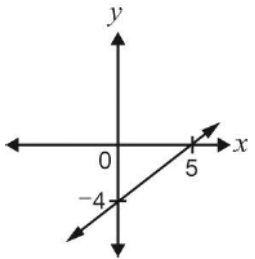
b.



c.



d.





18. Fresh Springs Water Company delivers bottled water.

The total cost of the water,  $C$ , in dollars, is represented by  $C = 8 + 1.5n$ , where  $n$  is the number of litres.

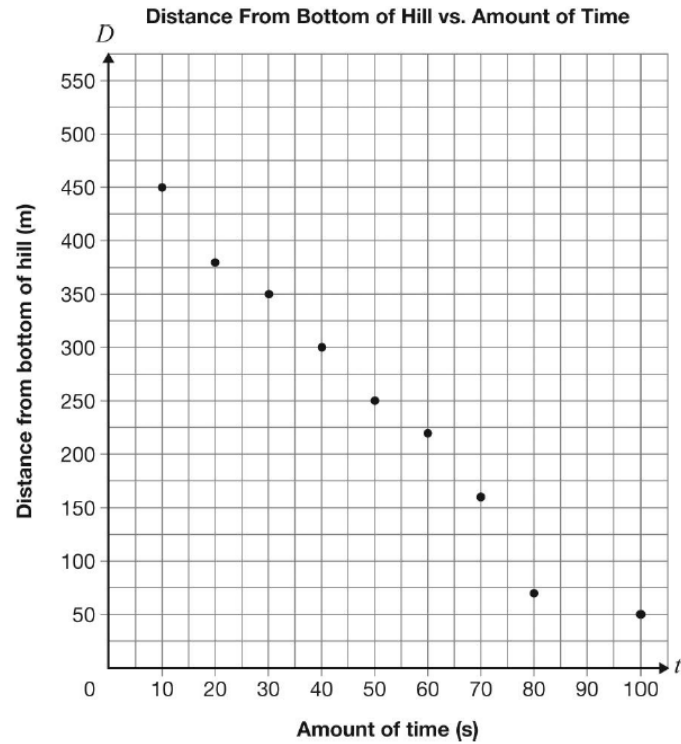
Which of the following statements could be true?

Customers who order more than 1 L of water will pay

- a. \$1 for every 9.5 L of water.
- b. \$9.50 for each litre of water.
- c. an \$8 delivery charge and \$1.50 per litre of water.
- d. a \$1.50 delivery charge and \$8.00 per litre of water.

## 9. How Fast Can You Ski?

This scatter plot shows the relationship between the distance a downhill skier is from the bottom of a ski hill and the amount of time the skier has been on the hill.



Draw an appropriate line of best fit for the data.

Determine an equation for your line of best fit.

Show your work. If using technology, provide support to show why your answer is correct.

$$D = \underline{\hspace{10em}}$$

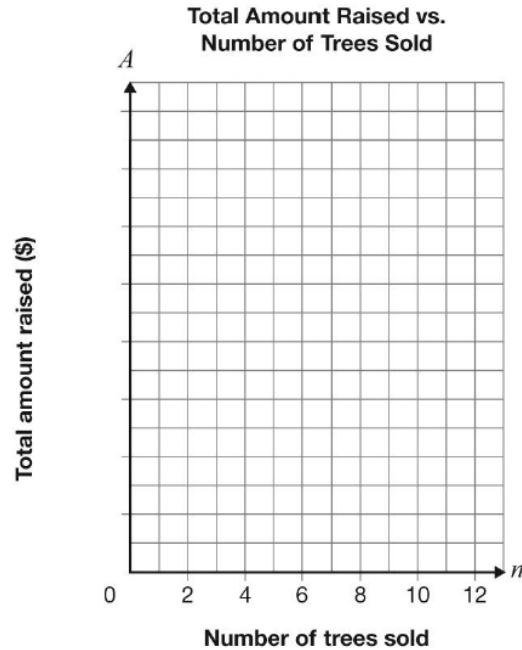
## 10. Tree Planting

A high school's environmental club is selling trees to raise money. The club starts with a donation from the principal and then collects money for each tree it sells.

Information about the linear relationship between the total amount raised and the number of trees sold is given.

Graph all the data from the table on the grid. Include an appropriate scale on the vertical axis.

Number of trees sold, $n$	Total amount raised, $A$ (\$)
3	240
9	420
11	480



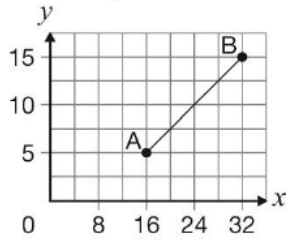
Determine an equation to represent the relationship between the total amount raised,  $A$ , and the number of trees sold,  $n$ .

Show your work.

$A =$  \_\_\_\_\_

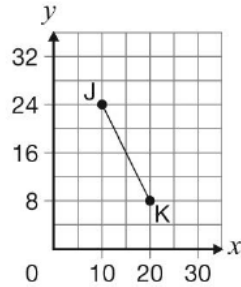
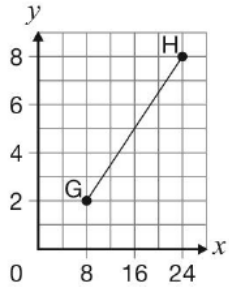
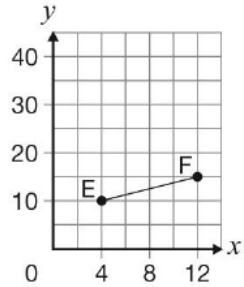
# 11. Comparisons

Line segment AB has a slope of  $\frac{5}{8}$ .



Slope of  $\overline{AB} = \frac{5}{8}$

Determine the slope of line segments EF, GH and JK below.



Slope of  $\overline{EF} = \underline{\hspace{2cm}}$

Slope of  $\overline{GH} = \underline{\hspace{2cm}}$

Slope of  $\overline{JK} = \underline{\hspace{2cm}}$

Complete the chart by comparing the slope of each of line segments EF, GH and JK to the slope of line segment AB if all the line segments were graphed on the same grid.

	Line segment EF	Line segment GH	Line segment JK
<b>Comparison to line segment AB</b>	Circle one: parallel perpendicular neither	Circle one: less steep more steep same steepness	Circle one: parallel perpendicular neither

## 12. The Better Choice

Shane has a choice between two jobs helping people around his neighbourhood.

- **Job A:** Shane's total pay is shown on the grid below.
- **Job B:** Shane will receive base pay of \$30, plus \$12.50 per hour.

Determine the conditions under which Shane should select Job A and the conditions under which he should select Job B.

Justify your answer.

