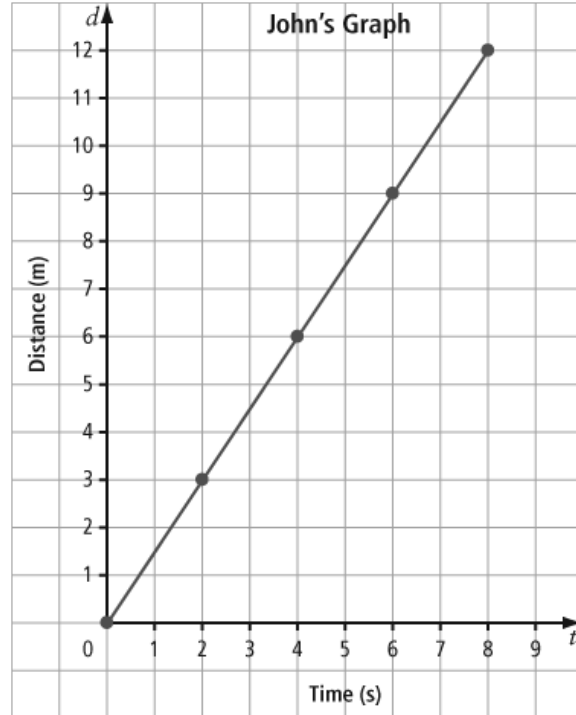
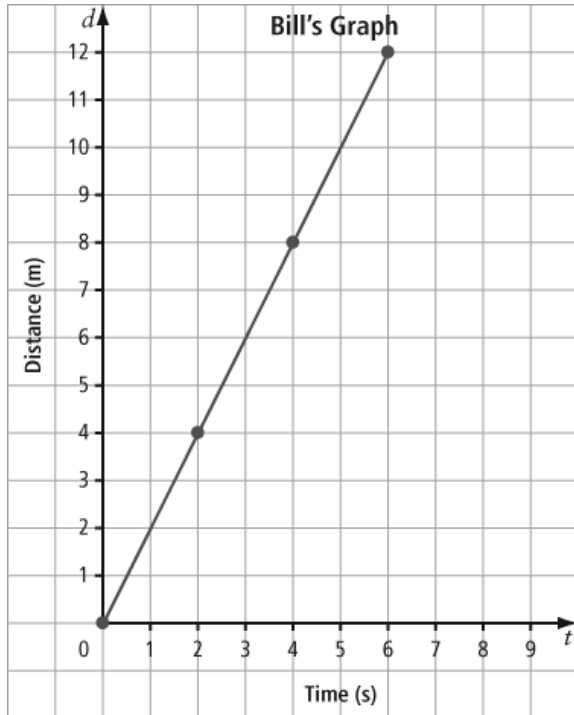


## Linear Relations Test – Grade 9 Math

Name: \_\_\_\_\_

Date: \_\_\_\_\_

1) Use the graphs to answer the following questions. Circle the letter of the best answer.



A. Who walked at a faster rate?

- |         |   |
|---------|---|
| a. Bill | c. The graphs do not show who was faster. |
| b. John | d. They walked at the same rate.          |

B. Who walked farther in the first 4 s and by how much?

- |              |              |
|--------------|--------------|
| a. John; 1 m | c. Bill; 1 m |
| b. John; 2 m | d. Bill; 2 m |

C. Which linear relation represents John's graph?

- |                     |                 |
|---------------------|-----------------|
| a. $d = 1.5t$       | c. $d = 3t$     |
| b. $d = 1.5t + 1.5$ | d. $d = 3t + 3$ |

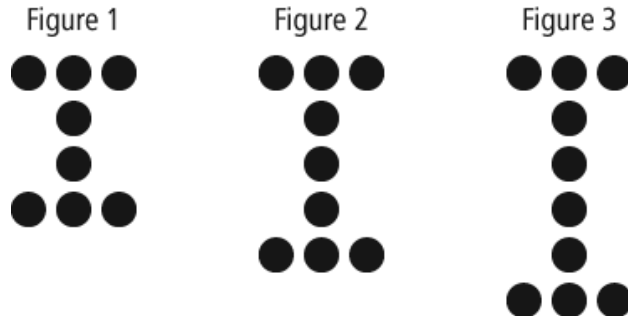
D. Which linear relation represents Bill's graph?

- |                 |                 |
|-----------------|-----------------|
| a. $d = 3t + 3$ | c. $d = 2t + 2$ |
| b. $d = 3t$     | d. $d = 2t$     |

E. At what time has Bill walked 3 m further than John?

- a. 2 s
- b. 4 s
- c. 6 s
- d. 8 s

2. Use the figures to answer the following question(s).



A. Following the pattern above, how many dots will Figure 5 contain?

- a. 10
- b. 11
- c. 12
- d. 13

B. Which table of values describes the pattern?

a.

Figure Number	Number of Dots
1	8
2	9
3	10

b.

Figure Number	Number of Dots
1	8
2	10
3	12

c.

Figure Number	Number of Dots
1	10
2	12
3	14

d.

Figure Number	Number of Dots
1	4
2	5
3	6

C. Which equation represents the relationship between the figure number ( $f$ ) and the number of dots ( $n$ ) in the figure?

- a.  $n = 2f + 5$
- b.  $n = 8f - 1$
- c.  $f = 7n + 1$
- d.  $n = f + 7$

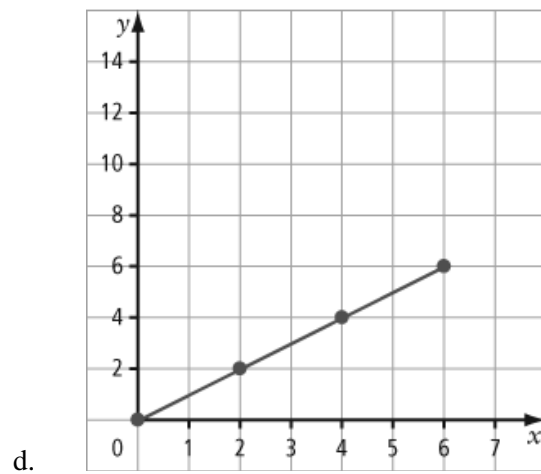
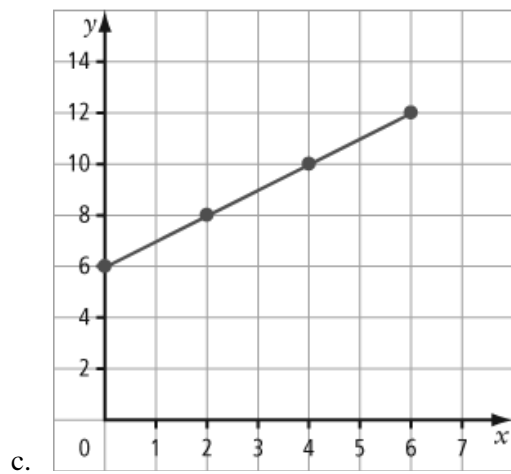
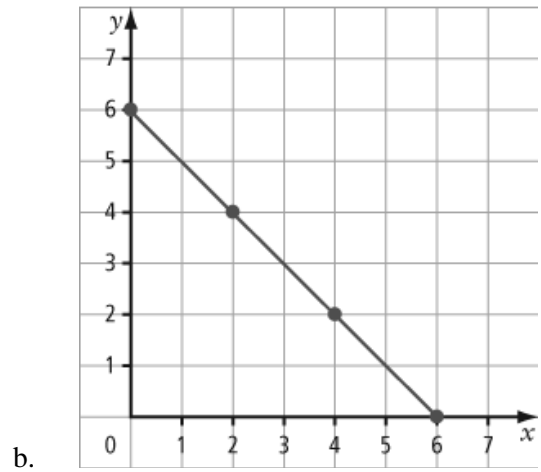
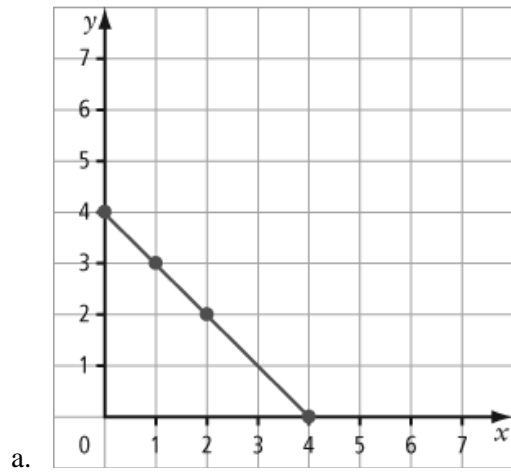
D. How many dots are in the ninth figure?

- a. 16
- b. 23
- c. 64
- d. 71

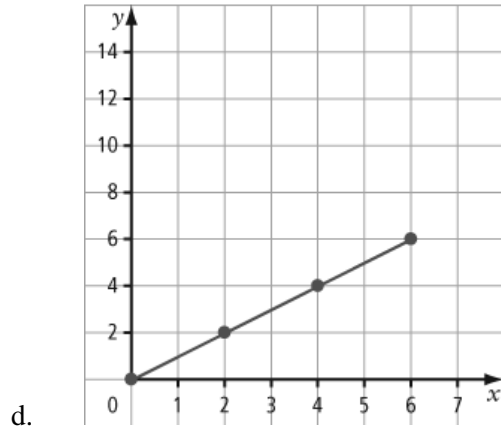
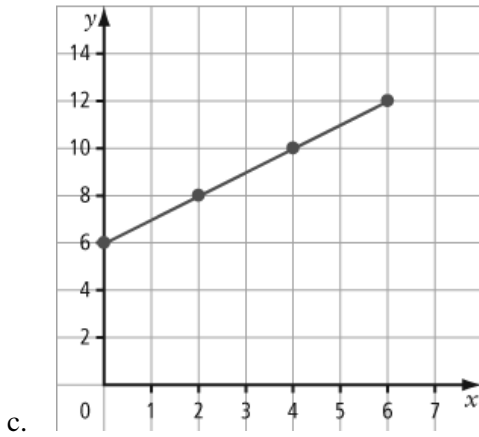
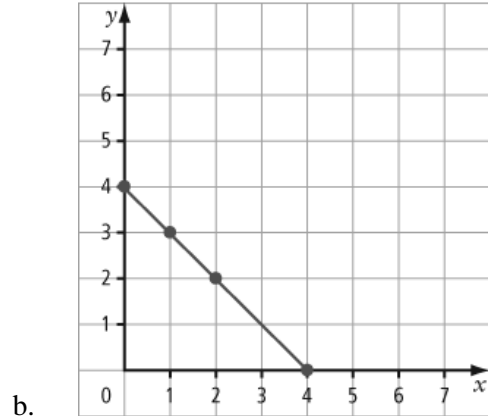
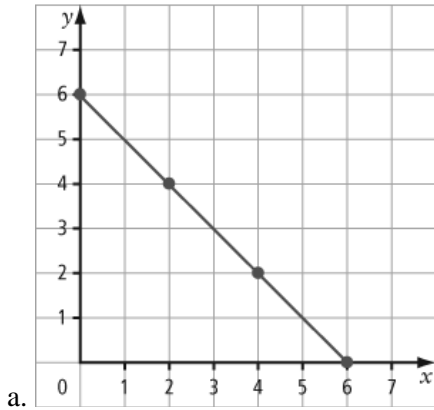
E. Which figure number will have 42 dots?

- a. 28
- b. 35
- c. 37
- d. 61

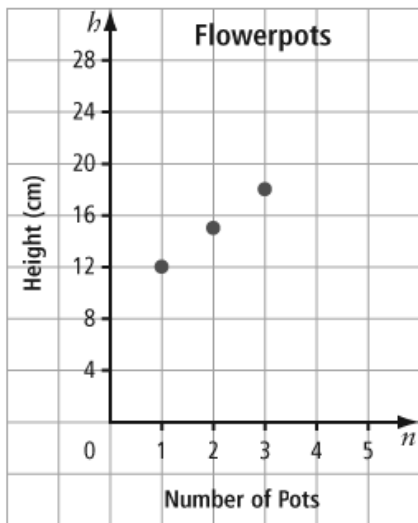
**3. Which graph represents the equation  $Y = -X + 6$**



4. Which graph represents the equation  $Y = X$  ?



5. As flowerpots are added individually to a stack, the height of the new stack is represented by the following graph. What is the height of a stack of 5 flowerpots?



a. 27 cm

b. 24cm

c. 21 cm

d. 18 cm

6. The linear equation that represents this table of values is \_\_\_\_\_.

$x$	$y$
0	4
1	3
2	2
4	0

7. Match the correct term to each of the following descriptions. A term may be used more than once or not at all.

- |    |                 |    |             |
|----|-----------------|----|-------------|
| a. | variable        | d. | interpolate |
| b. | linear relation | e. | extrapolate |
| c. | linear equation | f. | coefficient |

- \_\_\_\_\_ an equation whose graph is a straight line  
 \_\_\_\_\_ a symbol (usually a letter) in mathematical expressions and equations  
 \_\_\_\_\_ a relation that appears as a straight line when graphed  
 \_\_\_\_\_ to estimate a value between two given values  
 \_\_\_\_\_ to estimate a value beyond a set of given values

8. Your school is ordering new school jackets. There is a flat fee of \$350 for the crest design plus \$75 per jacket.

a) Create a table of values showing the cost to produce 0, 100, 200, 300, and 400 jackets. The first is done for you.

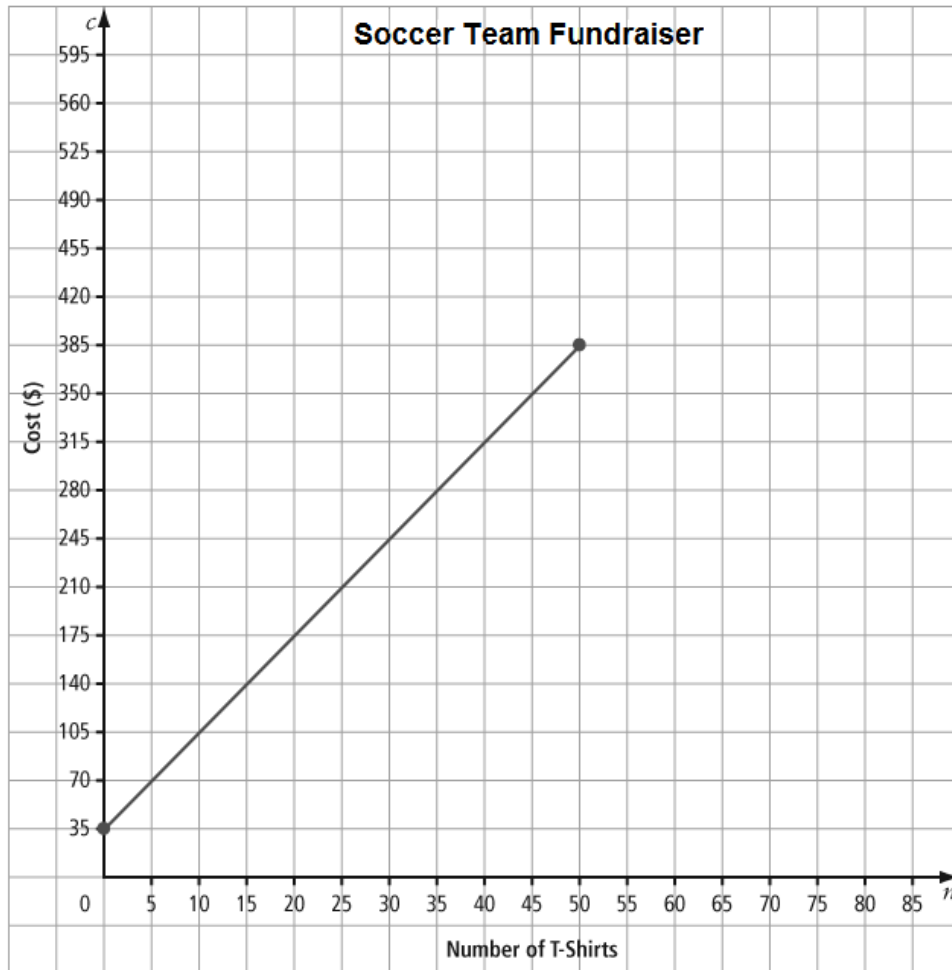
Number of Jackets (N)	0				
Cost (C)	350				

b) What is an equation that can be used to predict the cost (C) of producing any number of jackets (N)

c) What is the cost of producing 500 jackets? Show your thinking.

d) What is cost, per jacket, if 750 jackets are ordered? Show your calculations. Round to the nearest cent.

**9. A soccer team is buying T-shirts to sell as a fundraiser. The team pays a flat fee of \$35 for a logo design plus \$7.00 per T-shirt. The following graph represents the relationship between the number of T-shirts and the total cost.**



- a) By interpolation, how much would it cost to have 30 T-shirts produced?
- b) Use extrapolation to determine how many T-shirts the team can order if they have \$525.

**10. The Holiday Inn Banquet Hall uses a table of values to show how much they charge to serve lunch to different numbers of people.**

<b>Number of People, <math>n</math></b>	0	20	40	60
<b>Cost, <math>c</math> (\$)</b>	75	175	275	375

a) Write the linear equation that describes the relation between  $n$  and  $c$ . \_\_\_\_\_

b) Graph the relationship represented in the table of values.

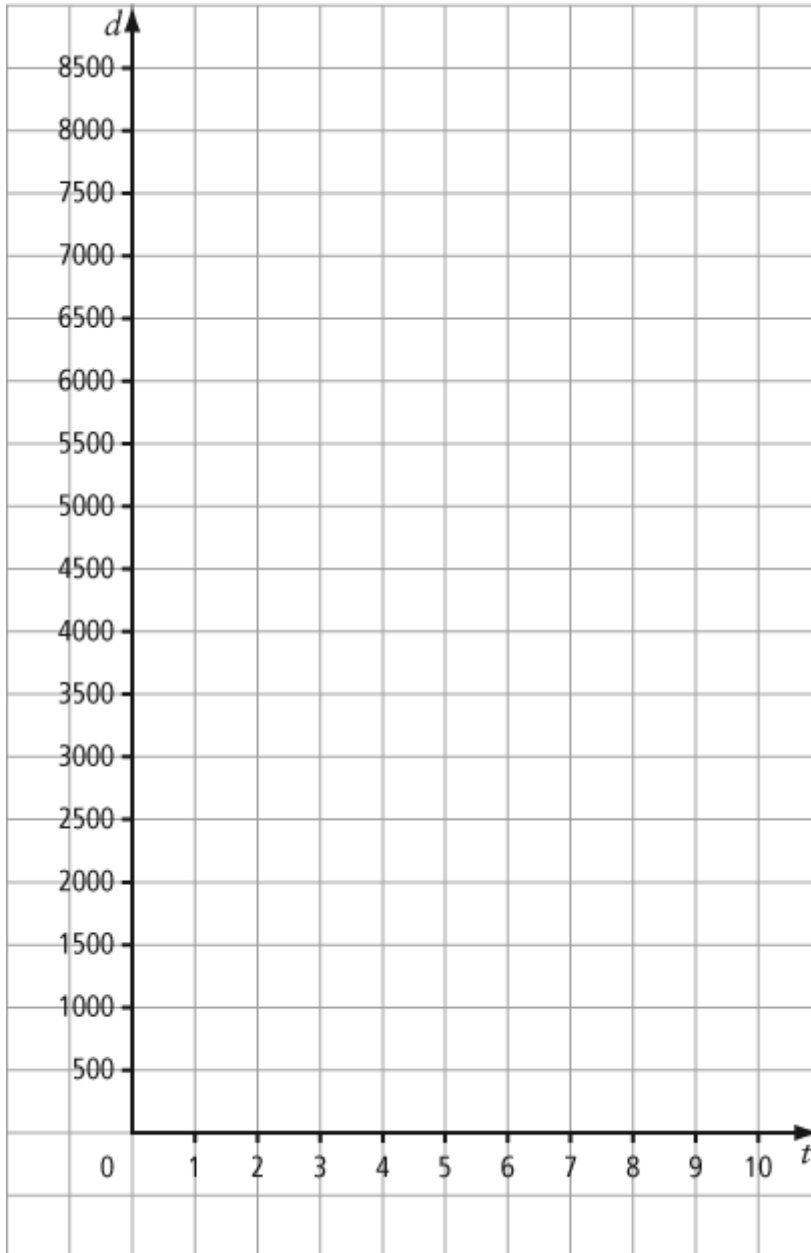


**b)** How much would lunch cost for 25 people? Use interpolation above and verify the answer below using the equation.

**c)** How much would lunch cost for 110 people? Use extrapolation above and verify the answer below using the equation.

11. A jet flies from Toronto to Rome. Its flight can be modelled by the linear equation  $d = 7200 - 800t$ , where  $d$  is the distance (in kilometres) from Rome and  $t$  is the time (in hours)

a) Graph the linear relation.



b) Use this graph to interpolate how long it takes to fly 4000 km?



12) The letter Z is constructed from dots. The first three diagrams are shown below.

Figure 1

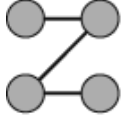


Figure 2

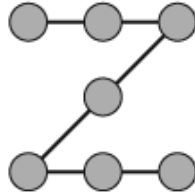
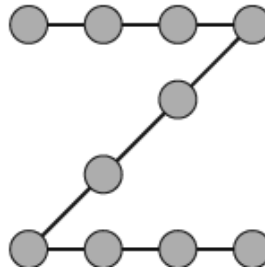


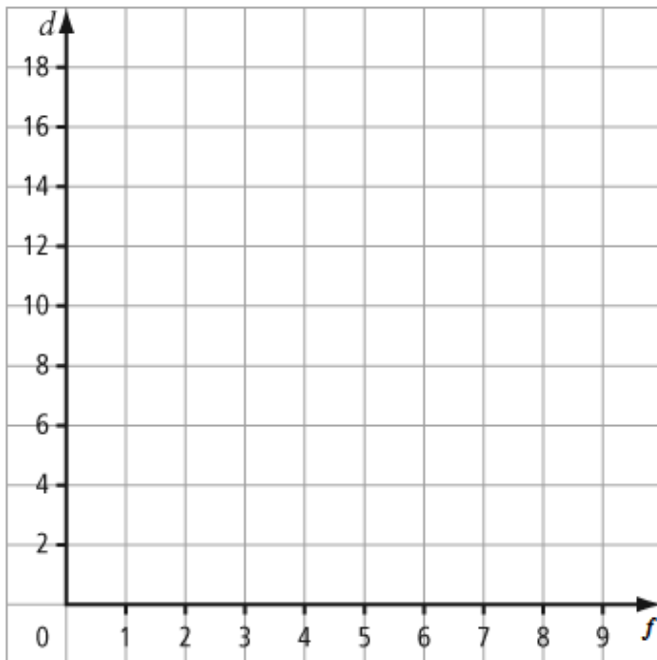
Figure 2



a) Draw the next diagram.

b) Create a table of values showing the relationship between the figure number,  $f$ , and the number of dots,  $d$ , for the first four figures.


c) Graph the table of values.



d) What is the equation that represents the relationship between the figure number,  $f$ , and the number of dots,  $d$ ?

\_\_\_\_\_

e) How many dots would be in Figure 8? Show your thinking.

\_\_\_\_\_

**13. Graph the following linear equations (remember to make a table of values first):**

a)  $Y = 4X + 3$



b)  $Y = -3x - 2$



c)  $Y = \frac{x}{3} + 2$



d)  $Y = 3$

