Name: _____ Class: _____ Date: _____ ID: A

gr 9 math review linear relations

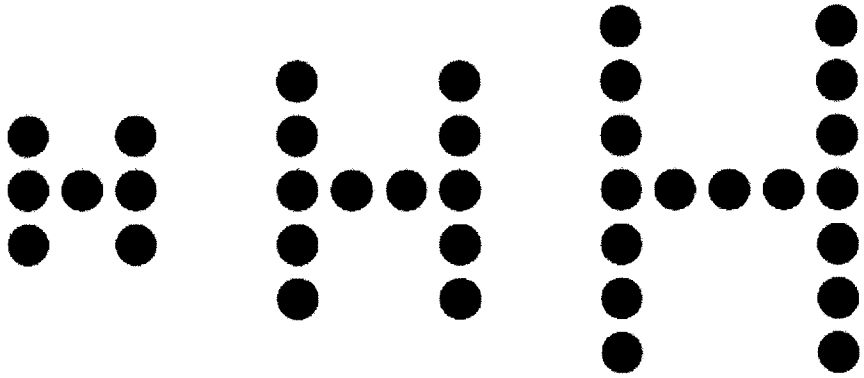
Key

Multiple Choice

Identify the choice that best completes the statement or answers the question.

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

Figure 1 Figure 2 Figure 3



A 1. Which table of values represents the number of dots in the pattern?

a.

Figure Number	Number of Dots
1	7
2	12
3	17

c.

Figure Number	Number of Dots
1	5
2	10
3	15

b.

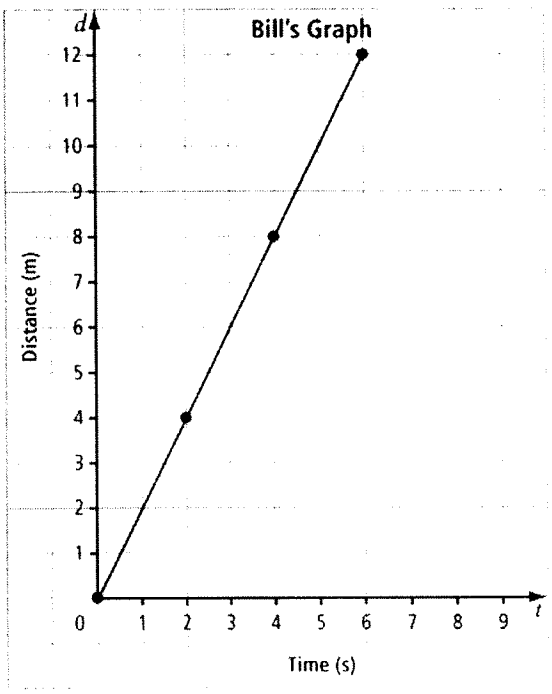
Figure Number	Number of Dots
1	7
2	10
3	13

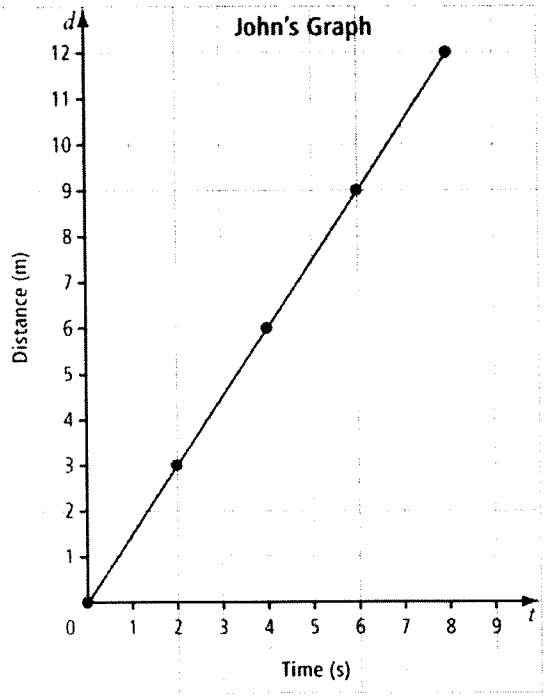
d.

Figure Number	Number of Dots
1	6
2	10
3	14

Name: _____ ID: A

Use the graphs to answer the following question(s).





A

2. Which linear relation represents John's graph?

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

Name: _____ ID: A

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

Figure 1

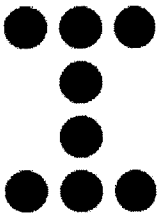


Figure 2

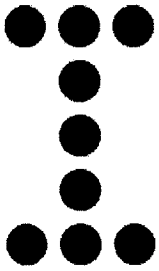
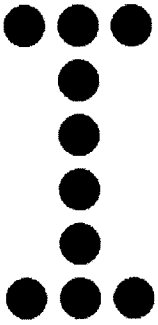


Figure 3



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3. 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.

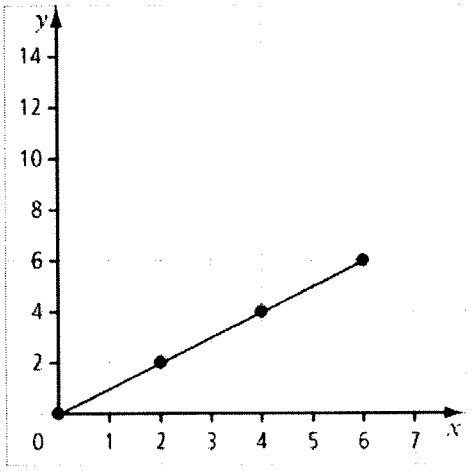
Figure Number	Number of Dots
1	4
2	5
3	6

Name: _____ ID: A

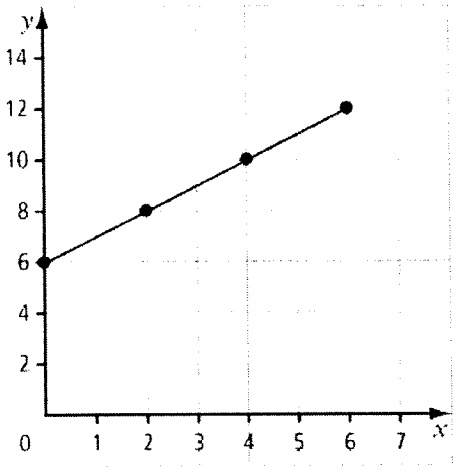
D 4. Which graph represents the following table of values?

x	y
6	0
4	2
2	4
0	6

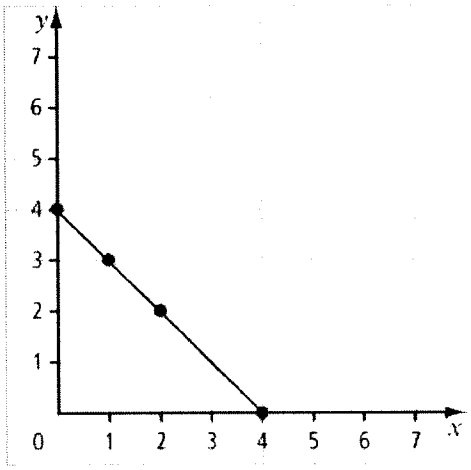
a.



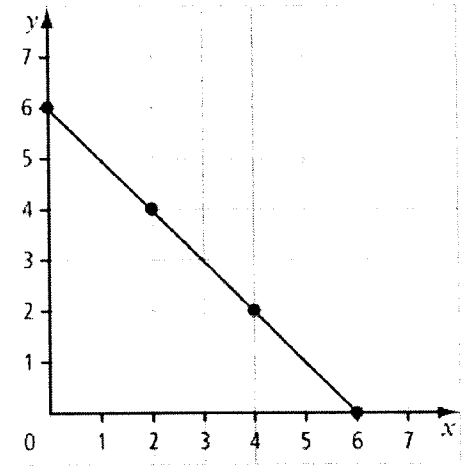
c.



b.



d.



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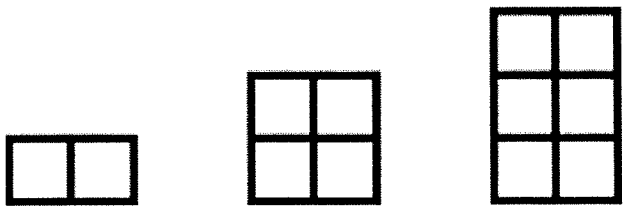
Key

Short Answer

5. Each square in the pattern has a side length of 1 cm.

Figure 1 Figure 2 Figure 3



a) Create a table comparing the figure number with the area for that figure. Extend the table to include the next two figures in the pattern.
b) What is a linear equation that represents this pattern?

6. Theater tickets cost $65.00 each. Complete the table of values and develop a linear equation that relates the cost to the number of tickets.

Number of Tickets, n	Cost, c ($)
1	
2	
3	
4	
5	

6. ANS:

Number of Tickets, n	Cost, c ($)
1	65
2	130
3	195
4	260
5	325

The linear equation represented by this table of values is $c = 65n$.

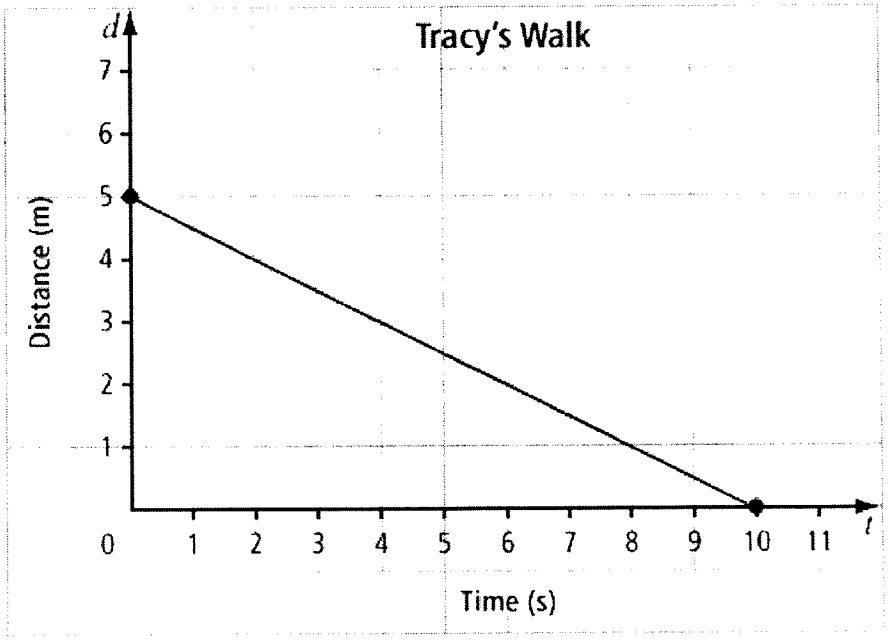
5. ANS:

a)

Figure Number, f	Area, a (cm^2)
1	2
2	4
3	6
4	8
5	10

b) The linear equation representing this pattern is $a = 2f$.

7. Tracy is walking near a motion detector.
   a) How far was Tracy from the sensor when she began walking?
   b) Was she walking toward or away from the motion sensor at the time?
   c) How long did it take her to reach the motion sensor?



8. **a)** What is the linear equation of the vertical line that passes through the point (3, 4)?
   b) What is the linear equation of the horizontal line that passes through the point (3, 4)?

7. ANS:
   a) She was 5 m from the sensor when she began walking.

   b) She was walking toward the motion sensor.

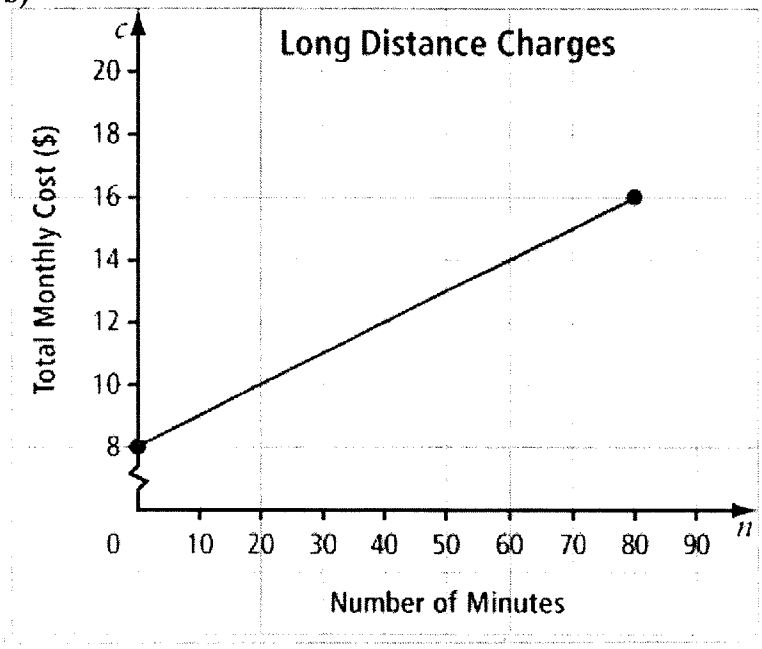
   c) It took her 10 s to reach the motion sensor.

8. ANS:
   a) The linear equation of the vertical line that passes through the point (3, 4) is $x = 3$.

   b) The linear equation of the horizontal line that passes through the point (3, 4) is $y = 4$.

9. A long distance phone plan charges a flat fee of \$8 per month, plus \$0.10 per minute of call time.
a) Write a linear equation to represent the relationship between the number of minutes of call time, n, and the total monthly cost, c.
b) Graph the linear relation using 0 min as the first point and 80 min as the last.

b)



c) What is the total cost for a month where the call time is 75 min?

9. ANS:
a) $c = 0.10n + 8$

c) $c = 0.10n + 8$

$= 0.10(75) + 8$

$= 7.5 + 8$

$= 15.5$

The total monthly cost is \$15.50.

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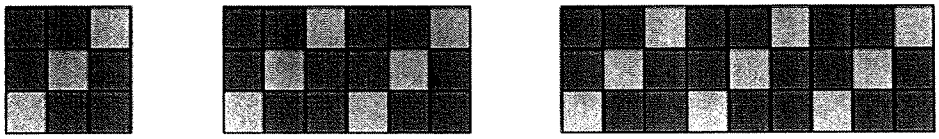
Problem

10. Abby and Braden are tiling a floor. All tiles are square. The figure below shows how many tiles Abby and Braden put in place, by the hour.

1 h **2 h** **3 h**



a) Complete the table of values.

Hours Worked	1	2	3	4	5
Number of Light Grey Tiles					
Number of Dark Grey Tiles					

b) How many light grey tiles have been laid in five h?
c) If there are 60 dark grey tiles to be laid, how long did it take to complete the work?

10. ANS:

a)

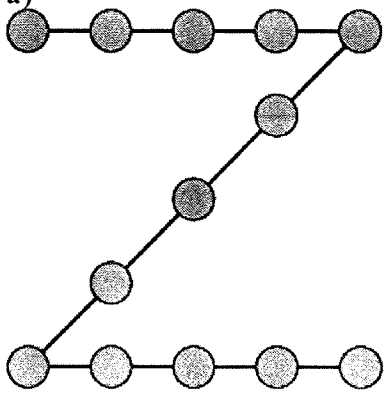
Hours Worked	1	2	3	4	5
Number of Light Grey Tiles	3	6	9	12	15
Number of Dark Grey Tiles	6	12	18	24	30

b) In five h, 15 light grey tiles have been laid.

c) Since it takes 5 h to lay 30 dark grey tiles, it will take 10 h to lay 60 dark grey tiles.

11. ANS:

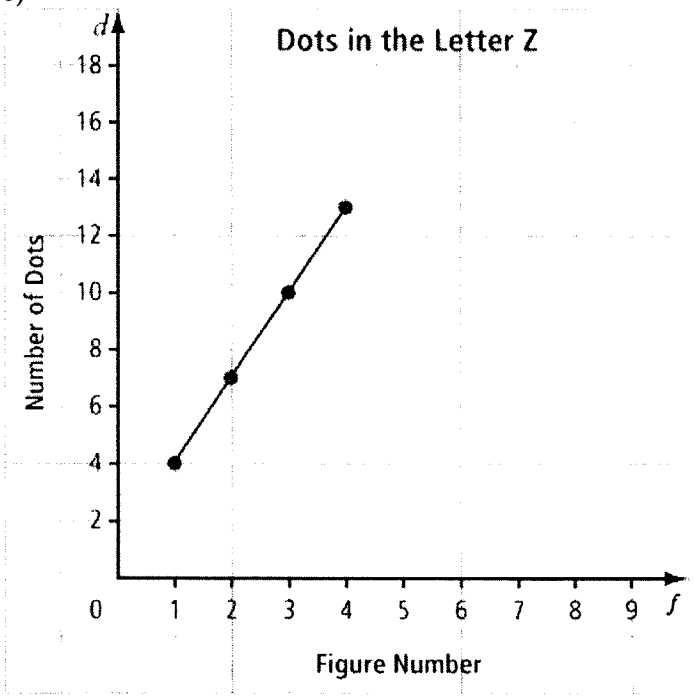
a)



b)

Figure Number, f	Number of Dots, d
1	4
2	7
3	10
4	13

c)



d) The number of dots in each figure is three times the figure number plus one.

e) The equation that represents the relationship between the figure number, f, and the number of dots, d, is $d = 3f + 1$.

f) $d = 3(8) + 1$

$= 24 + 1$

$= 25$

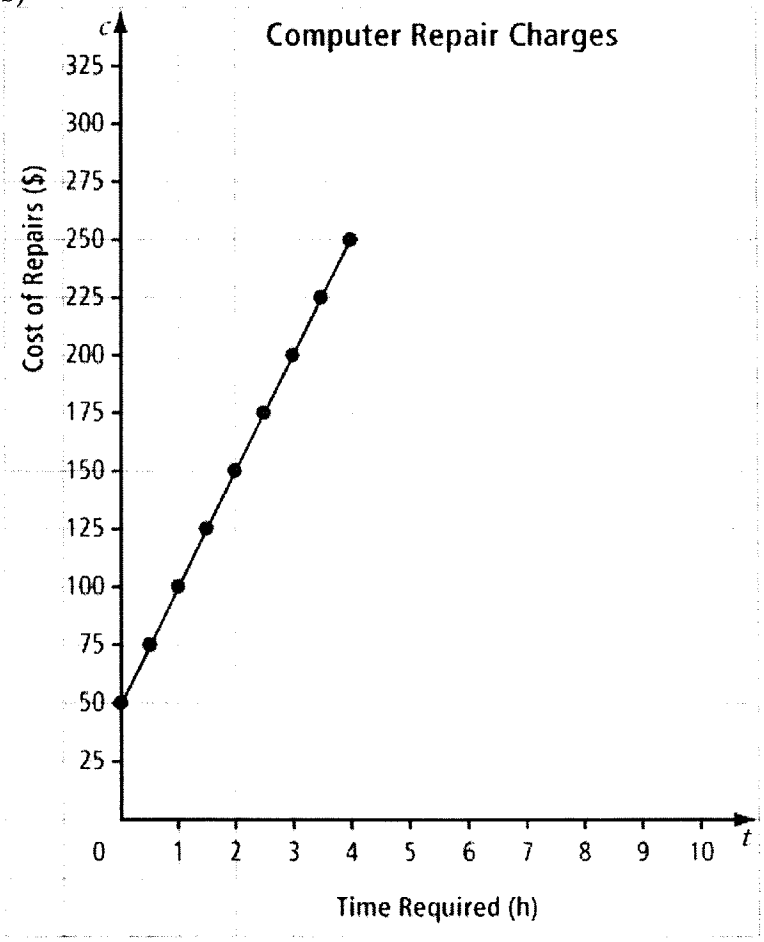
There would be 25 dots in Figure 8.

12. ANS:

a)

Repair Time, t	Repair Cost, c ($)
0	50
.5	75
1	100
1.5	125
2	150
2.5	175
3	200
3.5	225
4	250

b)

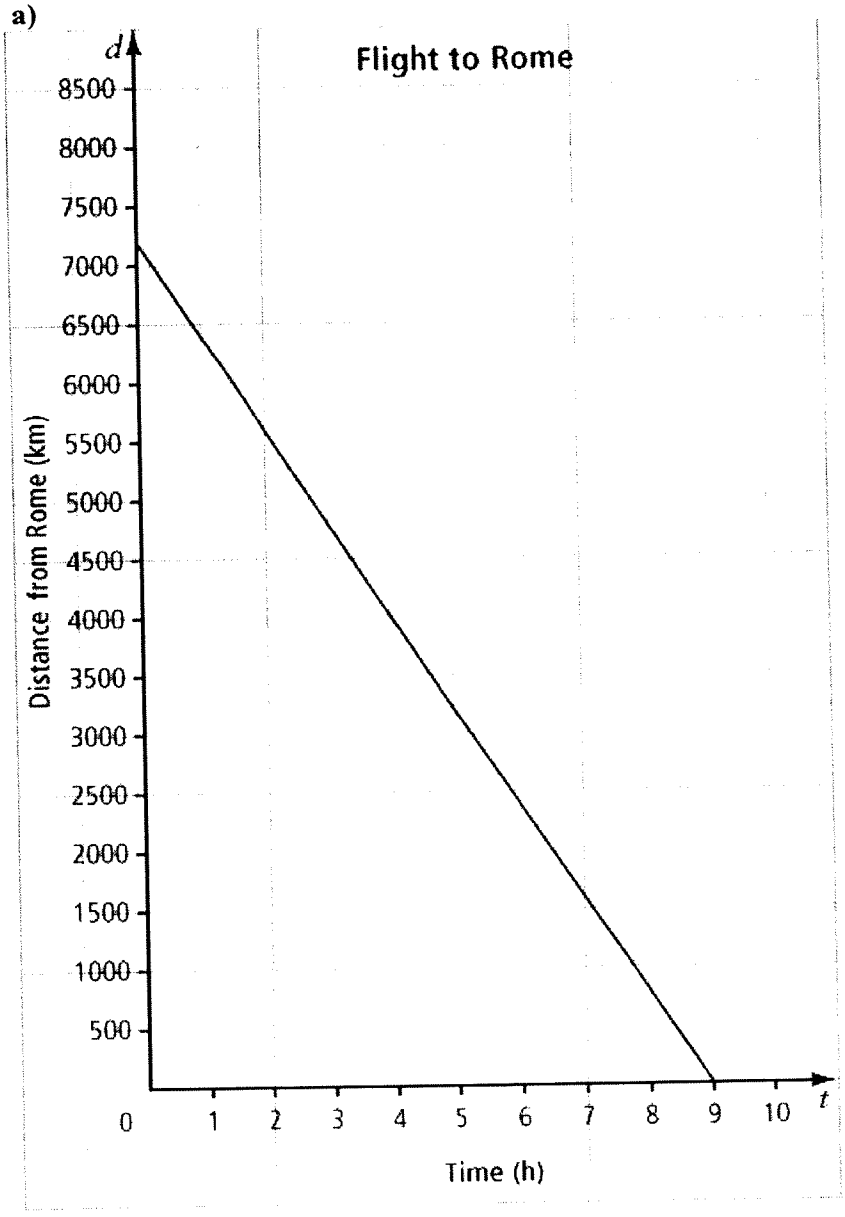


c) Using interpolation or the table, a 3 h repair will cost $200.

d) Extrapolating from the graph, it took 7 h to complete a repair costing $400.

13. 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) How long does it take to fly 4000 km?

a)



b) By interpolation, it takes 4 h to fly 4000 km.