MATH9 - Unit 4 Test – Version 1 **Name:** Key

REMEMBER:
P(2,3) is a point where the fist number is *x*, and the second number is *y*.
A liner relation shows a pattern in both *X* and *Y*.

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

C 1. In a table of values for a pattern, $P = 12$ when $n = 3$. Determine the equation that might represent the pattern. (All you have to do is substitute!)

a. $P = 4n + 6$ b. $P = 24 - 3n$ c. $P = 4(6 - n)$ TRUE! d. $P = 4(n + 6)$

$12 = 4(3) + 6$ NOT TRUE $12 = 24 - 3(3)$ not TRUE $12 = 4(6-3)$ $12 = 4(3)$ $12 = 4(3+6)$ Not TRUE

A 2. The pattern in this table continues. Determine the expression that relates the number of triangles to the figure number.

x (independent variable)

Figure, *f*	1 ×2	2 ×2	3	4	5
Number of Triangles, *t*	2	4	6	8	10

$t = 2 \times f$

a. $2f$ b. $2 + t$ c. $2t$ d. $2 + f$

(dependent variable), y

C 3. Complete the table of values.

$y = -x + 6$

x	0	1	2	3
y	6	5	4	3

$x = 0$: $y = -0 + 6 = 6$

$x = 1$: $y = -1 + 6$, $y = 5$

the pattern is −1 (goes down by 1)

a.

x	0	1	2	3
y	−6	−7	−8	−9

b.

x	0	1	2	3
y	5	4	3	2

c.

x	0	1	2	3
y	6	5	4	3

d.

x	0	1	2	3
y	0	−6	−12	−18

X	Y
0	9
1	9
2	4
2	18

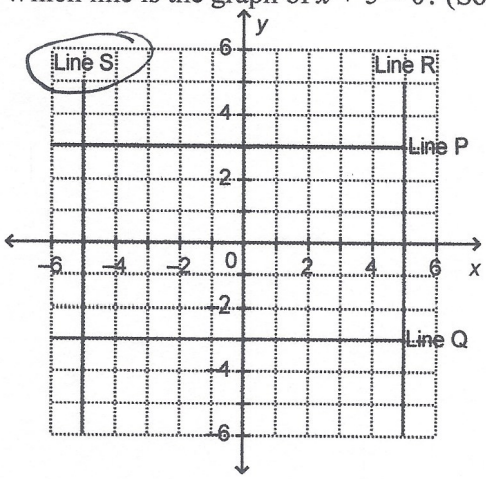
$9 = 14 - 5(0)$ NOT TRUE
$9 = 14 - (5)(1) = 9$
$4 = 14 - (5)(2) = 4$
$18 = 14 - 5(2)$ NOT TRUE

D 4. Which points lie on the graph represented by the equation $y = 14 - 5x$?

P(1, 9) Q(2, 18) R(2, 4) S(0, 9)

a. P and Q b. Q and R c. R and S d. P and R

D 5. Which line is the graph of $x + 5 = 0$? (Solve the equation by isolating the variable!)



$x + 5 = 0$
$-5 \quad -5$
$x = -5$

A line that touches the x-axis at -5

a. Line R b. Line Q c. Line P d. Line S

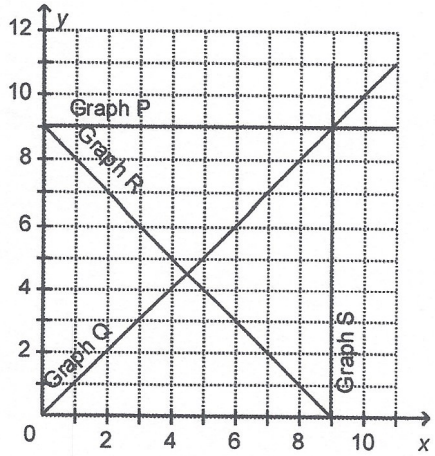
C 6. Describe the graph of the equation $x + 7 = 0$.

a. A vertical line that intersects the x-axis at 7.
b. A horizontal line that intersects the y-axis at –7.
c. A vertical line that intersects the x-axis at –7.
d. A horizontal line that intersects the y-axis at 7.

$x + 7 = 0$
$x + \cancel{7} = 0 - 7$
$\cancel{-7}$
$\boxed{x = -7}$

a vertical line that goes through the x-axis at -7

A 7. Which graph on this grid has the equation $x = 9$?

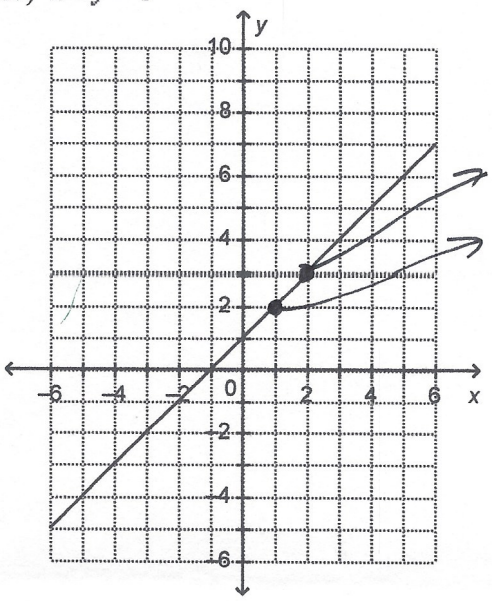


- Graph Q can't be correct, it's an oblique line and it has to have x and y in its equation.
- Same case for graph R
- Graph P goes through the y-axis at $\boxed{y = 9}$
- graph S goes through the x-axis at $x = 9$

a. Graph S b. Graph Q c. Graph R d. Graph P

C 8. Which equation describes the graph below? (Solve each equation by isolating one variable. Then, make a table of values).

i) $x+y=-1$
ii) $x-y=-1$
iii) $x+y=1$
iv) $x-y=1$



• Pick a couple of ordered pair points, and substitute

Use (1,2) where $x=1$, $y=2$

i) $1+2=-1$ NOT TRUE
ii) $1-2=-1$ ✓ TRUE
iii) $1+2=1$ NOT TRUE
iv) $1-2=-1$ NOT TRUE

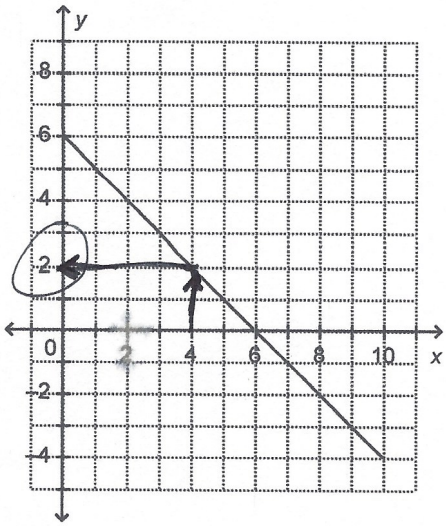
Since ii seems to be the right answer, try another point

(2,3) $x=2$ $y=3$

ii) $x-y=-1 \Rightarrow 2-3=1$ ✓ it checks

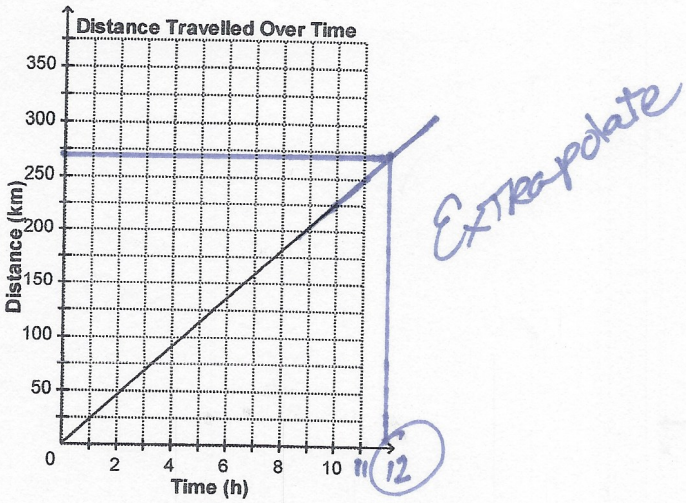
a. iii b. i c. ii d. iv

B 9. This graph represents a linear relation. Determine the value of y when $x=4$.



a. 0 b. 2 c. 10 d. 6

B 10. A car travels at a constant speed.
The graph shows how the distance of the car changes with time.
Estimate the time it takes to travel 270 km.

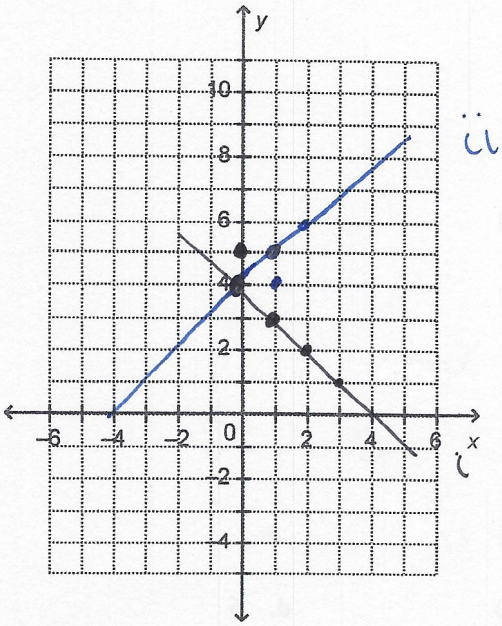


a. 1 h b. 12 h c. 13 h d. 11 h

Short Answers

11. Graph the following lines on the same grid. Label the lines. (Solve the equation by isolating a variable, and then make a table of values).

i) $x+y=4$
ii) $x-y=-4$



i) $x+y=4 \Rightarrow \cancel{x}+y=4-x$
$-\cancel{x}$

$\boxed{y=4-x}$

x	y
0	4
1	3
2	2
3	1

ii) $x-y=-4 \Rightarrow \cancel{x}-y=-4-x$
$-\cancel{x}$

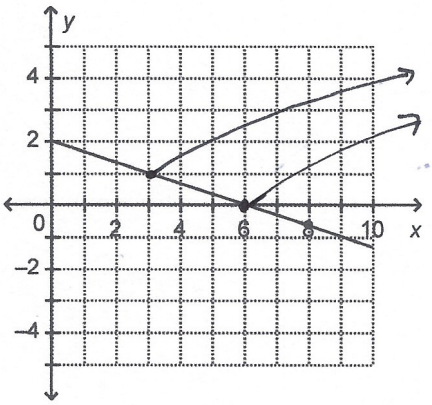
$-y=-4-x$

or $\boxed{y=4+x}$

x	y
0	4
1	5
2	6
3	7

12. Which equation describes the graph?

i) $x = 6 + 3y$
ii) $3y = x + 6$
iii) $x + 3y = 6$
iv) $-3y = -x + 6$



(3, 1)
(6, 0)

- Make a Table of value
OR
get ordered pairs, and substitute

Using (3,1) $x = 3$, $y = 1$

i) $3 = 6 + 3(1)$ NOT TRUE
ii) $3(1) = 3 + 6$ NOT TRUE
iii) $x + 3y = 6 \Rightarrow 3 + 3(1) = 6$ ✓
iv) $-3(1) = -3 + 6$ NOT TRUE

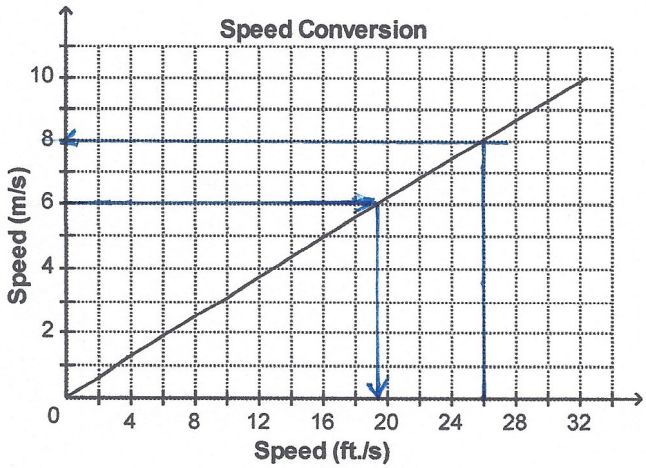
- Since iii seems to be correct, try (6, 0)

$x + 3y = 6 \Rightarrow 6 + 3(0) = 6$ it holds.

13. This graph shows how a speed in feet per second relates to a speed in metres per second.

a) Estimate the speed in feet per second of an object moving at 6 m/s.

b) Estimate the speed in metres per second of an object moving at 26 ft./s.



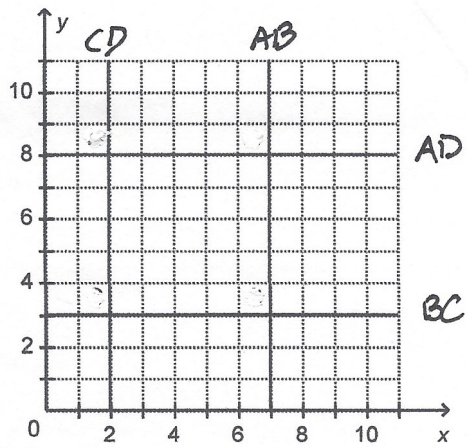
a) ≈ 19 ft/s

b) 8 m/s

Problems

14. The lines on the grid below intersect to form square ABCD.
Write the equation for each of the following lines: *(HINT: Describe which axis, and where, the line intercepts).*

a) AB $x = 7$ b) BC $y = 3$ c) CD $x = 2$ d) AD $y = 8$



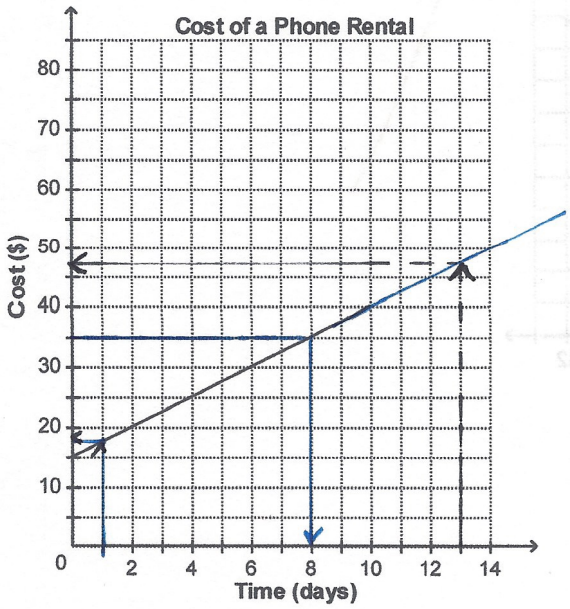
15. A resort rents out mobile phones by the day. This graph shows how the cost to rent a phone relates to the number of days the phone is rented.

a) Estimate the cost to rent a phone for:

i) 1 day ≈ 17.5 $ to rent the phone for 1 day

ii) 13 days ≈ $47.5 to rent the phone for 13 days

b) A customer paid $35.00 to rent a phone. For how many days did the customer rent the phone?



For $35.00, the costumer can rent the phone for 8 days