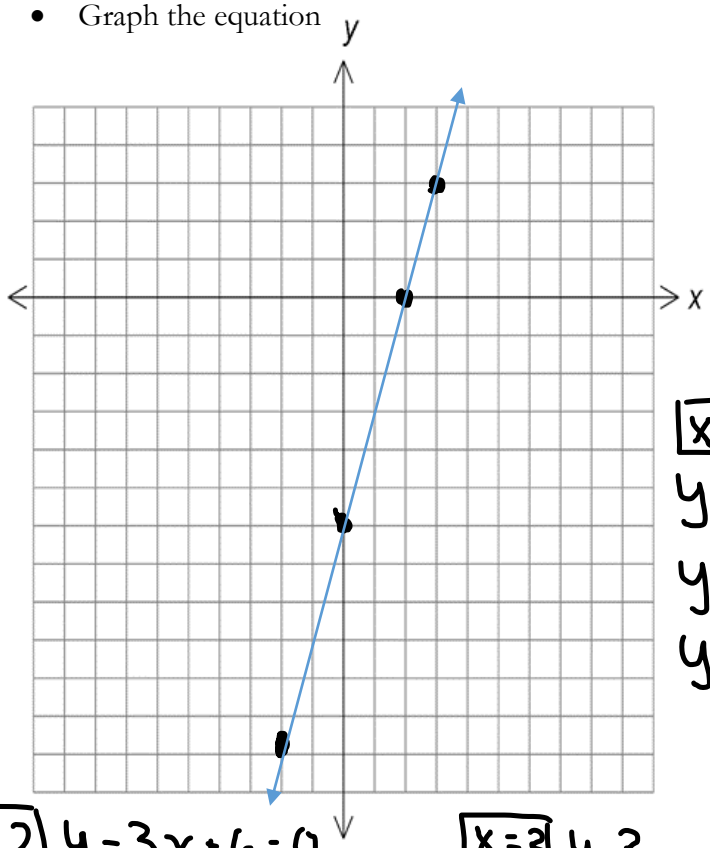
GRADE 9 MATH UNIT 4 TEST

Constructed Response

11. Given the equation: $y - 3x + 6 = 0$ [5 marks]

- Complete a table of values for the given values of x (Show steps for one y-value calculation).
- Graph the equation



x	y
-2	-12
0	-6
2	0
3	3

$x = -2$

$y - 3x + 6 = 0$

$y - 3(-2) + 6 = 0$

$y + 6 + 6 = 0$

$y + 12 = 0$

$-12 \quad -12$

$y = -12$

$x = 0$

$y - 3x + 6 = 0$

$y - 3(0) + 6 = 0$

$y + 0 + 6 = 0$

$y + 6 = 0$

$-6 \quad -6$

$y = -6$

$x = 2$ $y - 3x + 6 = 0$

$y - 3(2) + 6 = 0$

$y - 6 + 6 = 0$

$y + 0 = 0$

$y = 0$

$x = 3$ $y - 3x + 6 = 0$

$y - 3(3) + 6 = 0$

$y - 9 + 6 = 0$

$y - 3 = 0$

$+3 \quad +3$

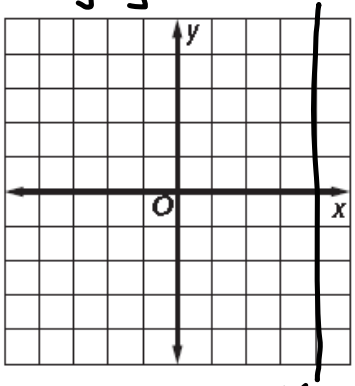
$y = 3$

12. 13. Graph $2x - 5 = 3$ [2 marks]

$+5 \quad +5$

$\frac{2x}{2} = \frac{8}{2}$

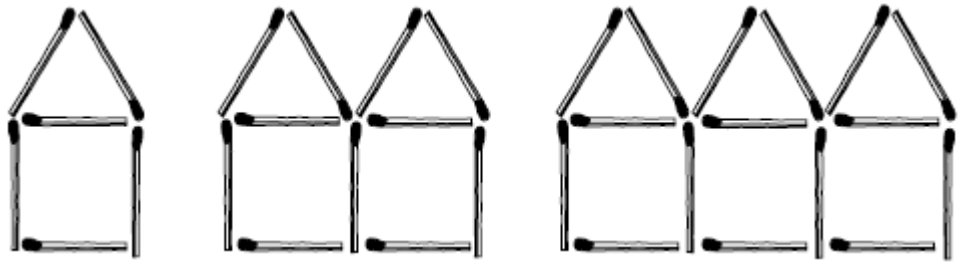
$x = 4$



$x = 4$

GRADE 9 MATH UNIT 4 TEST

13. Matches are used to make a pattern of houses. Assume that the pattern continue as shown.



h	m	
1	6	)5
2	11	)5
3	16	

A) Write an equation that shows the relationship between the number of matches (m) and the number of houses(h). [1 mark]

$m = 5h + 1$

B) Use your equation to determine how many houses can be built with 41 matches. [1 marks]

$m = 41$

$m = 5h + 1$

$41 = 5h + 1$

$-1 \quad -1$

$\frac{40}{5} = \frac{5h}{5}$

$h = 8$

C) Is the relation linear or nonlinear? Explain how you know. [1 mark]

Linear because a constant change in the independent variable produces a constant change in the dependent variable.

D) Is the relation continuous or discrete? Explain how you know. [1 mark]

Discrete because you cannot have a part of a house or match.

E) If you build 15 houses how many matches will you need? [1 mark]

$h = 15$

$m = 5h + 1$

$m = 5(15) + 1$

$m = 75 + 1$

$m = 76$

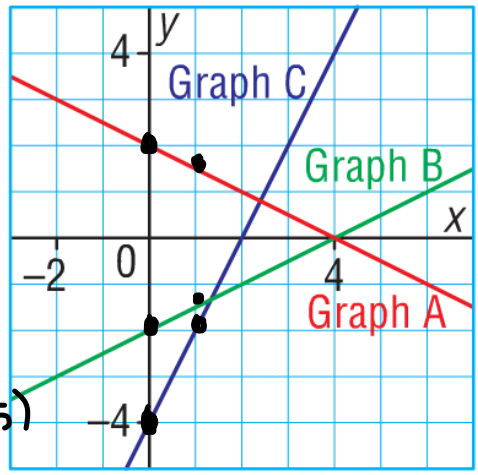
F) When you answered part E) did you interpolate or extrapolate? Explain how you know. [1 mark]

Extrapolate because it was outside the given data values.

GRADE 9 MATH UNIT 4 TEST

15. Match Graphs A, B and C to the correct equation. Show all workings. [4 marks]

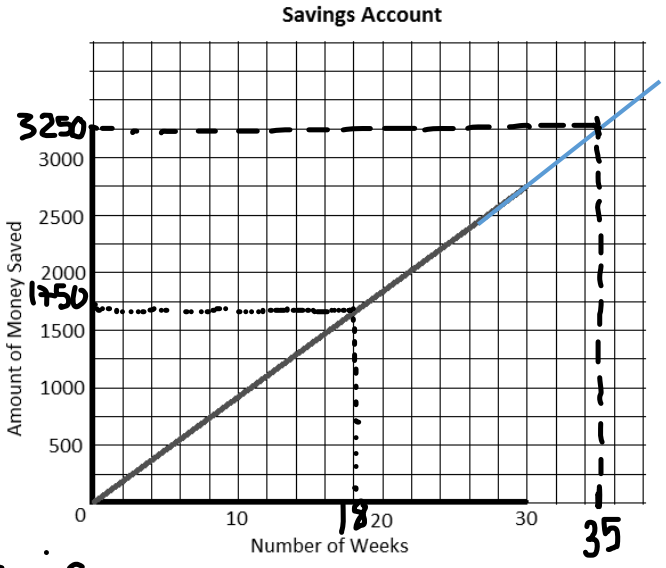
(i) $y = 2x - 4$	(ii) $2y + x = 4$	(iii) $x = 2y + 4$
$x=0$: $y=2x-4$, $y=2(0)-4$, $y=0-4$, $y=-4$, $(0,-4)$	$x=0$: $2y+x=4$, $2y+0=4$, $\frac{2y}{2}=\frac{4}{2}$, $y=2$, $(0,2)$	$x=0$: $x=2y+4$, $0=2y+4$, $-4 \quad -4$, $\frac{-4}{2}=\frac{2y}{2}$, $y=-2$, $(0,-2)$
$x=1$: $y=2x-4$, $y=2(1)-4$, $y=2-4$, $y=-2$, $(1,-2)$	$x=1$: $2y+x=4$, $2y+1=4$, $-1 \quad -1$, $\frac{2y}{2}=\frac{3}{2}$, $y=1.5$, $(1,1.5)$	$x=1$: $x=2y+4$, $1=2y+4$, $-4 \quad -4$, $\frac{-3}{2}=\frac{2y}{2}$, $y=-1.5$, $(1,-1.5)$
Graph C	Graph A	Graph B



12. This graph represents Rachel's savings account over the period of several weeks.

A) Estimate the amount of money Rachel has saved by week 18? Is this interpolation or extrapolation? Explain. [2 marks]

$ 1650, interpolation because it's inside the given data values.



B) Estimate the amount of money she will have saved by week 35? Is this interpolation or extrapolation? Explain. [2 marks]

$ 3250, this is extrapolation because it is outside the given data values.

C) Predict how long it will take her to save $3500. What assumptions are you making? [2 marks]

38 weeks, assuming she saves at a constant rate.

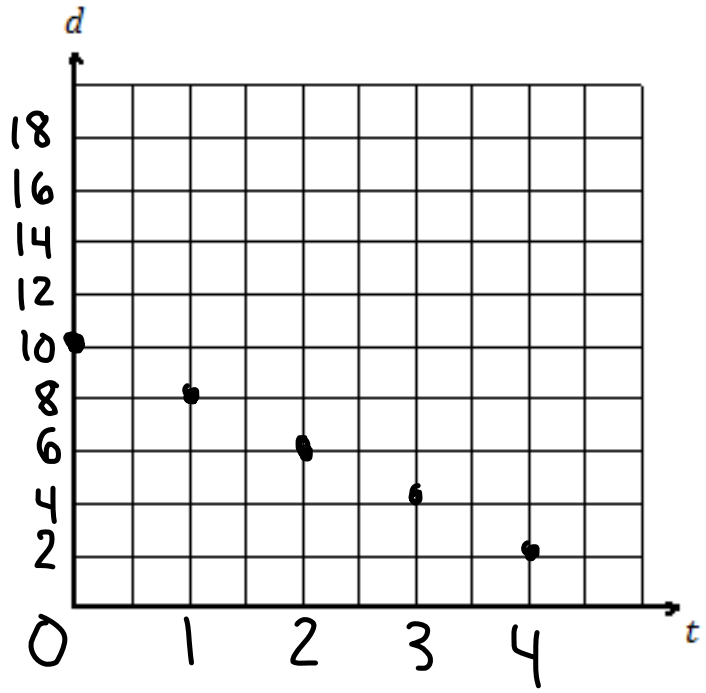
13. Sally walks **toward** a motion sensor while conducting a science experiment. She is 10 meters from the sensor when she starts and she walks 2 meters closer per second.

A) Complete the table of values. [2 marks]

Time (s)	0	1	2	3	4
Distance from sensor(m)	10	8	6	4	2

-2 -2 -2 -2

B) Graph the information from the above table. [2 marks]



C) Determine the equation, where ***d*** represents distance in meters and ***t*** represents time in seconds. [2 marks]

$m = -2s + 10$

D) Explain why you did or did not connect the points in the graph for question 8B) above. [1 marks]

I did not join the points because the data is discrete. She is only moving at each whole second.