

YEAR 9 MATHEMATICS

Term 3 Revision

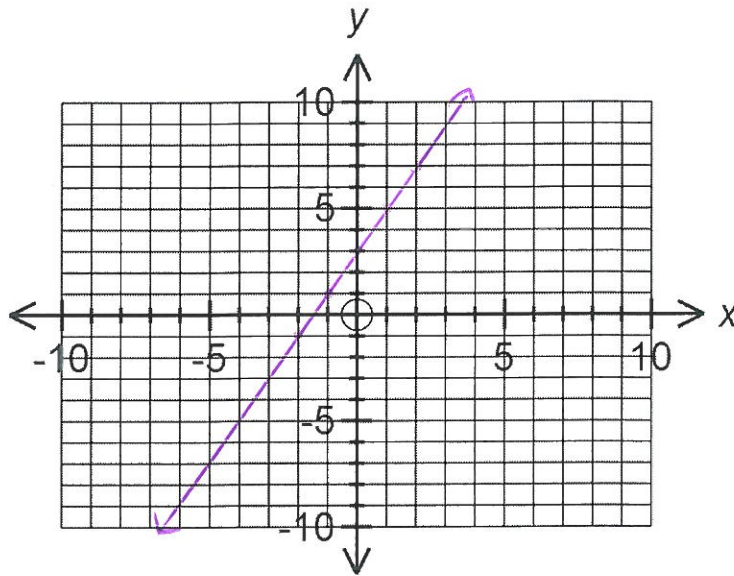
Solving and Graphing Linear Equations

Student name: Andrew

Question One: Plot the following linear relationship on the graph by completing the table and state the gradient and y-intercept.

a) $y = 2x + 3$
grad ↑ *yint* ↑

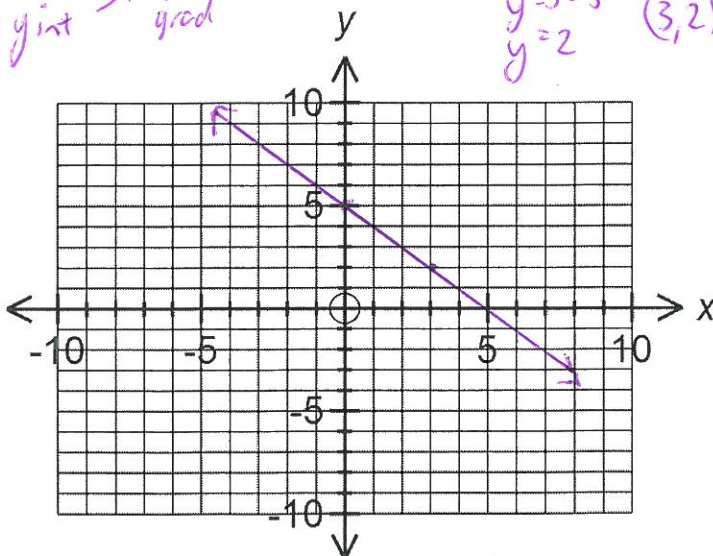
x	-2	-1	0	1	2	3
y	-1	1	3	5	7	9



Gradient = 2 Y Intercept = 3 (0,3)

Question Two: Plot the following linear relationship on to the graph below.

a) $y = 5 - x$
yint ↑ *grad* ↑
 $x = 3$
 $y = 5 - x$
 $y = 5 - 3$
 $y = 2$ $(3, 2)$



Gradient = -1

y Int coord = (0,5)

Question Three: Plot the following linear relationships on the graph and state the gradient for each

a) $y = -8$

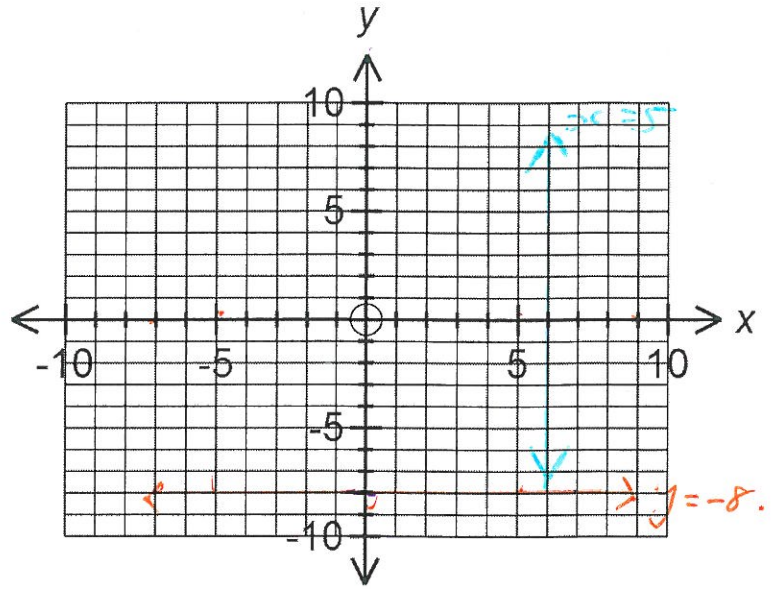
Gradient = 0 horizontal

b) $x = 6$

Gradient = undefined

$$\frac{y_2 - y_1}{x_2 - x_1} = \frac{-8 - (-8)}{5 - 0} = \frac{0}{5} = 0$$

$(0, -8)$ $(5, -8)$



Question Four: Plot the line $2y = -10 - 4x$ on the graph and state the gradient.

$$y = \frac{-10}{2} - \frac{4x}{2} \quad y = -5 - 2x$$

x Intercept = -2.5 $(-2.5, 0)$

y Intercept = -5

Gradient = -2

$$2y = -10 - 4x$$

$$2(0) = -10 - 4x$$

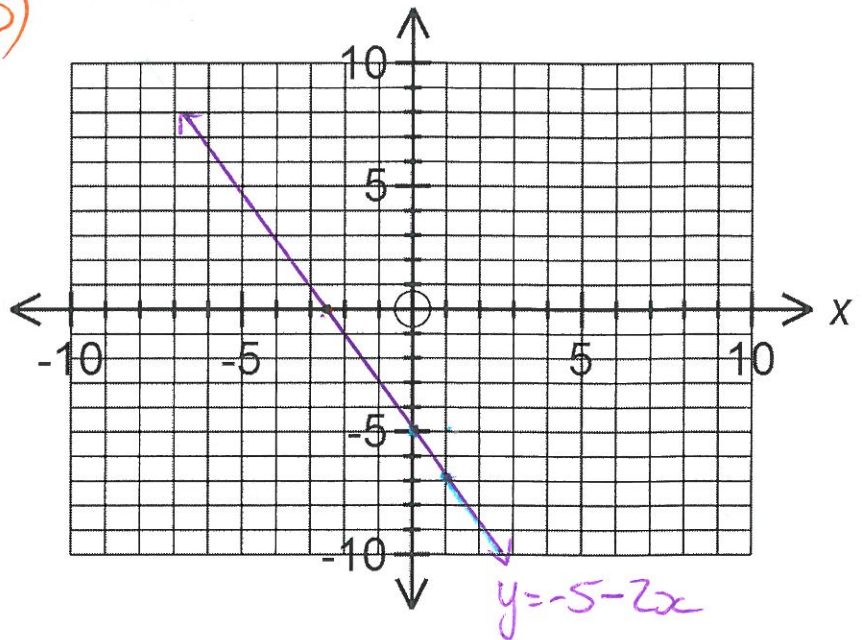
$$0 = -10 - 4x$$

$$0 + 10 = -4x$$

$$10 = -4x$$

$$\frac{10}{-4} = x$$

$$-2.5 = x$$



Question Five: Find the equations of the lines described below.

a) Has a gradient of 4 and passing through the point $(-1, 5)$

$$y = mx + c$$

$$y = 4x + c$$

$$5 = 4(-1) + c$$

$$5 = -4 + c$$

$$5 + 4 = c$$

$$9 = c$$

$$y = mx + c$$

$$y = 4x + 9$$

Find eqⁿ of line $ax+by$
 b) Passes through the points $(7,1)$ and $(5,-7)$

$$\frac{y_2 - y_1}{x_2 - x_1} = \frac{-7 - 1}{5 - 7} = \frac{-8}{-2} = 4 = m$$

$$y = mx + c$$

$$y = 4x + c$$

$$1 = 4(7) + c$$

$$1 = 28 + c$$

$$1 - 28 = c$$

$$-27 = c$$

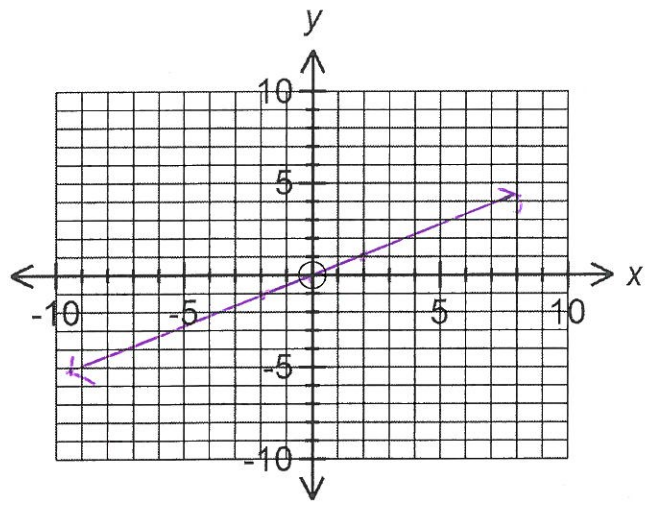
$$y = 4x - 27$$

Question Six: From the equations below circle which function or functions produce a line that is parallel to: $y = 3x + 7$:

- $y = 3x - 7$
- $y = \frac{1}{3}x + 2$
- $y = -\frac{1}{3}x - 6$
- $y = \frac{x}{3} - 7$
- $y = -\frac{x}{3} + 7$
- $y = 3x - \frac{1}{7}$

Question Seven: Plot the line $y = \frac{x}{2}$ on the graph by using the intercepts and state the gradient.

x	-2	-1	0	1	2	3
y	-1	-0.5	0	0.5	1	1.5



Gradient = $\frac{1}{2}$

y Int coord = $(0,0)$

Question Eight:

Calculate the gradient and y intercepts of the line passing through each pair of points and then state the equation of the line

a) $(1,3)$ and $(5,5)$

$$\frac{y_2 - y_1}{x_2 - x_1}$$

$$\frac{5 - 3}{5 - 1}$$

$$= \frac{2}{4} = \frac{1}{2}$$

$$y = mx + c \quad (1,3)$$

$$y = 0.5x + c$$

$$3 = 0.5(1) + c$$

$$3 = 0.5 + c$$

$$3 - 0.5 = c$$

$$2.5 = c$$

$$y = 0.5x + 2.5$$

b) $(-4, 8)$ and $(-2, -8)$

$$\frac{y_2 - y_1}{x_2 - x_1} = \frac{-8 - 8}{-2 - (-4)} = \frac{-16}{-2} = -8$$

$$y = mx + c \quad (-4, 8)$$

$$y = -8x + c$$

$$8 = -8(-4) + c$$

$$8 = 32 + c$$

$$8 - 32 = c$$

$$-24 = c$$

$$y = mx + c$$

$$y = -8x - 24$$

Question Nine:

For the following equations state the y intercept and the gradient:

$$4x + 2y = 6$$

$$2y = 6 - 4x$$

$$y = \frac{6 - 4x}{2}$$

$$y = 3 - 2x$$

Equation	Gradient	y-intercept
$y = 3x - 7$	3	-7
$y = -4x - 2$	-4	-2
$y = \frac{x}{2} + 5$	$\frac{1}{2}$	5
$y = \frac{5x}{2} + 12$	$\frac{5}{2}$ or 2.5	12
$y = 3 - 2x$	-2	3
$4x + 2y = 6$ $y = 3 - 2x$	-2	3
$x - 3y = 21$ $\frac{x}{3} - 7 = y$	$\frac{1}{3}$	-7

$$x + 3y = 21$$

$$x = 21 - 3y$$

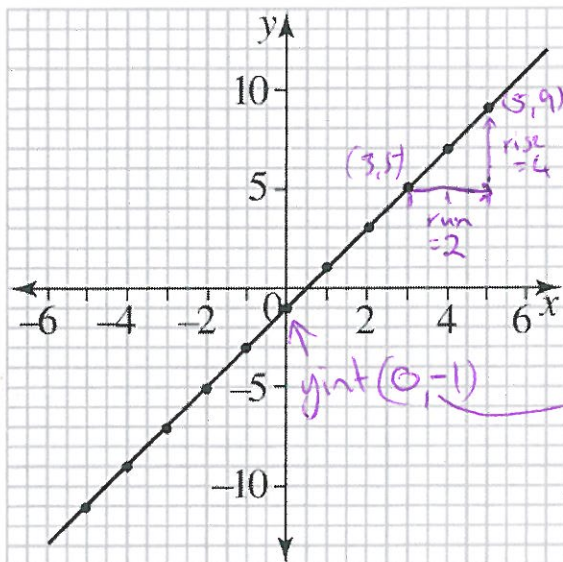
$$x - 21 = -3y$$

$$\frac{x - 21}{-3} = y$$

$$\frac{x}{-3} - 7 = y$$

Question Ten:

State the equation of the line for the following graph



grad

$$\frac{\text{rise}}{\text{run}} = \frac{4}{2} = 2$$

$$y = 2x - 1$$

gradient

$$\frac{y_2 - y_1}{x_2 - x_1} = \frac{9 - 5}{5 - 3} = \frac{4}{2} = 2$$