

Chapter 6 TEST

1. Are the following relations linear functions? Justify.

a)

| x | y |
|----|----|
| 2 | 5 |
| 4 | 8 |
| 6 | 11 |
| 10 | 17 |

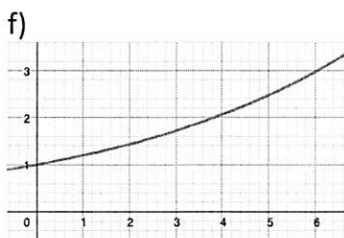
yes: a change of +2 of the independent variable corresponds to a change of +3 of the dependent variable.

b) $y = -3x + 5$ yes: $y = mx + b$

c) $y = 5$ yes: $y = mx + b$

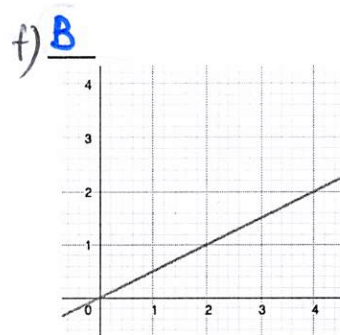
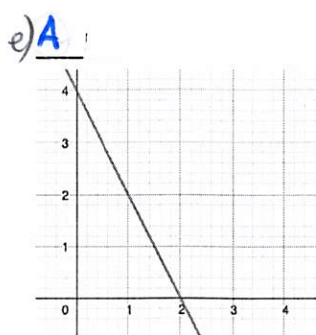
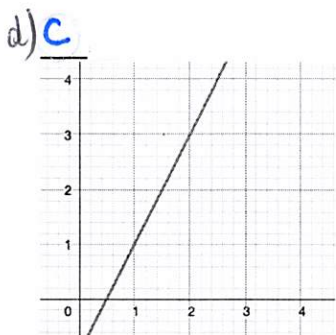
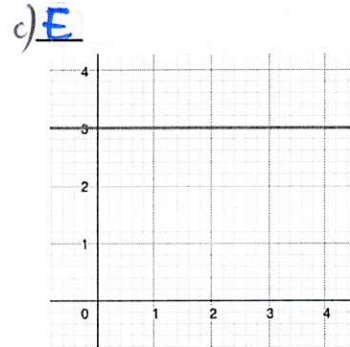
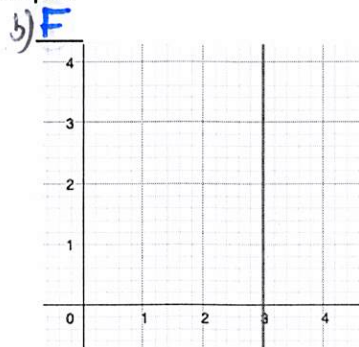
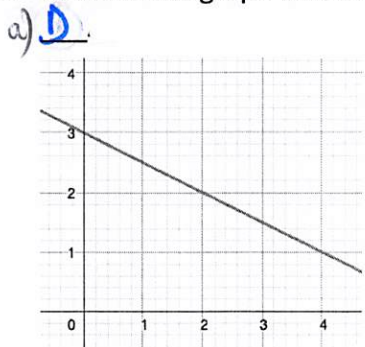
d) $x = 2$ no: it's linear, but it's not a function (vertical line)

e) $y = 2x^2 - 3$ no: the variable is squared.



no: the line is not straight.

2. Match each graph with its slope:



A. -2

B. $\frac{1}{2}$

C. 2

D. $-\frac{1}{2}$

E. 0

F. undefined

3. Determine if the following lines are parallel, perpendicular or neither.

| Equations | $y = -2x + 3$ | $y = 2x - 3$ | $y = \frac{1}{2}x + 3$ |
|-------------------------|---------------|--------------|------------------------|
| $y = -\frac{1}{2}x + 3$ | neither | \perp | neither |
| $y = \frac{1}{2}x - 3$ | \perp | neither | // |
| $y = -2x - 3$ | // | neither | \perp |

4. Let $A(4,3)$, $B(10,2)$, $C(11,7)$ and $D(5,8)$.

- a) Is ABCD a parallelogram?

$$m_{AB} = \frac{2-3}{10-4} = -\frac{1}{6} \quad m_{AD} = \frac{8-3}{5-4} = 5$$

$$m_{CD} = \frac{8-7}{5-11} = -\frac{1}{6} \quad m_{BC} = \frac{7-2}{11-10} = 5$$

$\left. \begin{array}{l} m_{AB} = -\frac{1}{6} \\ m_{CD} = -\frac{1}{6} \end{array} \right\} AB \parallel CD$

$\left. \begin{array}{l} m_{AD} = 5 \\ m_{BC} = 5 \end{array} \right\} AD \parallel BC$

\therefore yes
ABCD is a #

- b) Is it a rectangle?

m_{AB} and m_{AD} are not opposite reciprocal.

therefore $\angle BAD$ is not right \Rightarrow no ABCD is not a rectangle

5. Rewrite the following equations in slope-intercept forms:

a) $2x - 3y + 5 = 0$

$$-3y = -2x - 5$$

$$y = \frac{2}{3}x + \frac{5}{3}$$

b) $y + 2 = -\frac{1}{3}(x - 4)$

$$y + 2 = -\frac{1}{3}x + \frac{4}{3}$$

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

6. Rewrite the following equations in general forms:

a) $y - 2 = \frac{2}{7}(x + 14)$

$$y - 2 = \frac{2}{7}x + 4$$

$$7y - 14 = 2x + 28$$

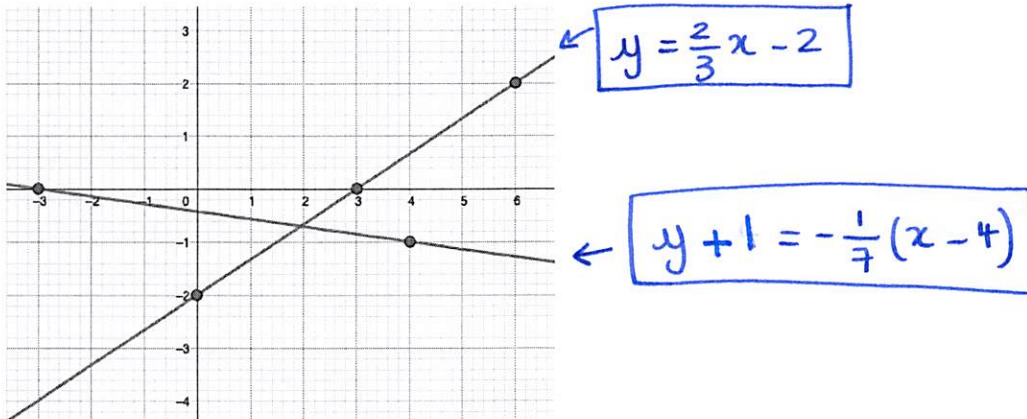
$$2x - 7y + 42 = 0$$

b) $y = -\frac{1}{3}x - 4$

$$3y = -x - 12$$

$$x + 3y + 12 = 0$$

7. Determine an equation for each line graphed below:



2

8. Determine the y-intercepts of the following functions:

a) $y = -3x + 5$

(5)

b) $y + 1 = \frac{1}{5}(x - 3)$

$y + 1 = \frac{1}{5}(0 - 3)$

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

(-8/5)

c) $2x - 3y + 5 = 0$

$-3y + 5 = 0$

(5/3)

2

9. Graph the following functions (show at least 2 exact points):

a) $y = -\frac{4}{5}x + 3$

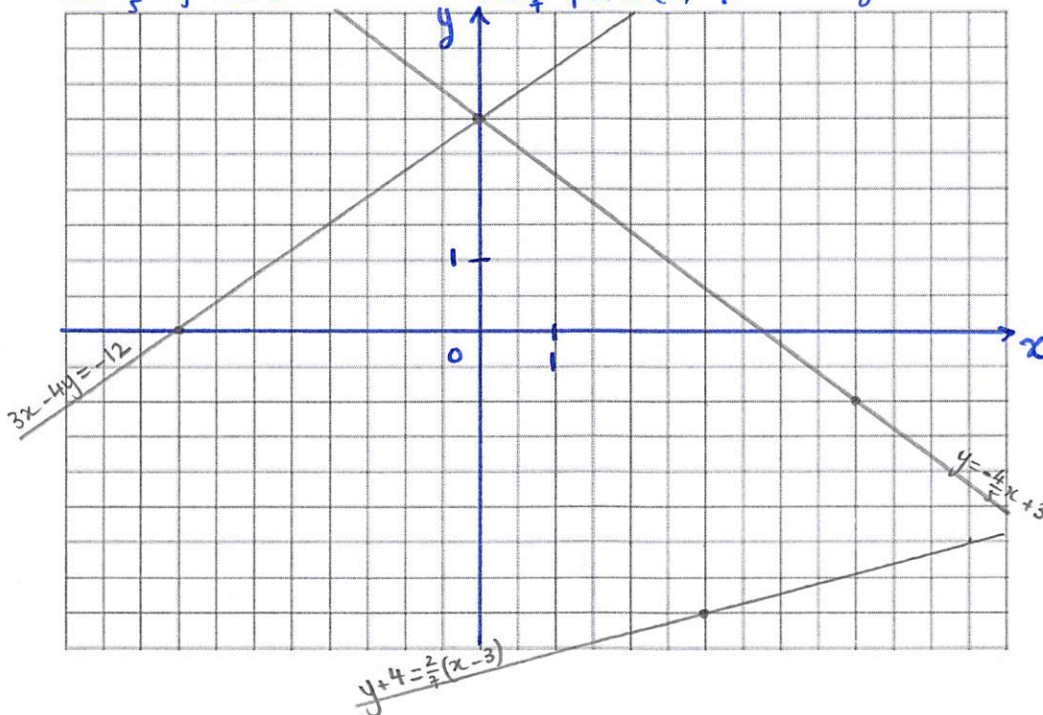
$m = -\frac{4}{5}$ y-int: 3

b) $y + 4 = \frac{2}{7}(x - 3)$

$m = \frac{2}{7}$ point (3, -4)

c) $3x - 4y = -12$

y-int: 3 x-int: -4



3

10. a) Determine an equation of a line going through the origin and perpendicular to the line with equation $y = \frac{1}{3}x + 4$.

$$m_{\perp} = -3$$

$$y\text{-int} = 0$$

$$\Rightarrow \boxed{y = -3x}$$

- b) Determine an equation in slope-intercept form of a line through $A(5, -4)$ and parallel to the line with equation $y = \frac{1}{4}x - 1$.

$$m_{\parallel} = \frac{1}{4}$$

$$y + 4 = \frac{1}{4}(x - 5)$$

changing form:

$$y = \frac{1}{4}x - \frac{5}{4} - 4$$

$$\boxed{y = \frac{1}{4}x - \frac{21}{4}}$$

11. Julian wants to order t-shirts online. The shipping fee is \$25 per order and each t-shirt costs \$31.50. Present your work clearly for each question.

- a) Determine an equation to represent the price paid, P , as a function of the number of t-shirts ordered, n .

$$\boxed{P = 31.5n + 25}$$

- b) How much will Julian pay if he orders 5 t-shirts?

$$P(5) = 31.5(5) + 25$$

$$= \boxed{\$182.50}$$

- c) Julian received a bill for \$277. How many t-shirts did he order?

$$277 = 31.5n + 25$$

$$252 = 31.5n$$

$$n = \frac{252}{31.5}$$

$$n = 8$$

\Rightarrow He ordered 8 t-shirts