

Practice Test – Linear Functions

Be Sure to SHOW ALL Work in a NEAT and ORGANIZED Fashion

KNOWLEDGE & UNDERSTANDING

1. a) Complete the table of values for the linear equation $y = 4x - 1$.

$m = 4$
 $b = -1$

- b) What is the slope of this equation?

$$m = 4$$

- c) What is the y-intercept?

$$b = -1$$

x	$y = 4x - 1$	(x, y)
-1	$y = 4(-1) - 1 = -5$	$(-1, -5)$
0	$y = 4(0) - 1 = -1$	$(0, -1)$
1	$y = 4(1) - 1 = 3$	$(1, 3)$
2	$y = 4(2) - 1 = 7$	$(2, 7)$

- d) Does the point $(-10, -40)$ lie on the line (algebraically **show your work**)? Hint: do L.S.=R.S. check

$$\begin{array}{l|l} \text{L.S.} & \text{R.S.} \\ = y & = 4x - 1 \\ = -40 & = 4(-10) - 1 \\ & = -41 \end{array}$$

\therefore It does not lie on the line

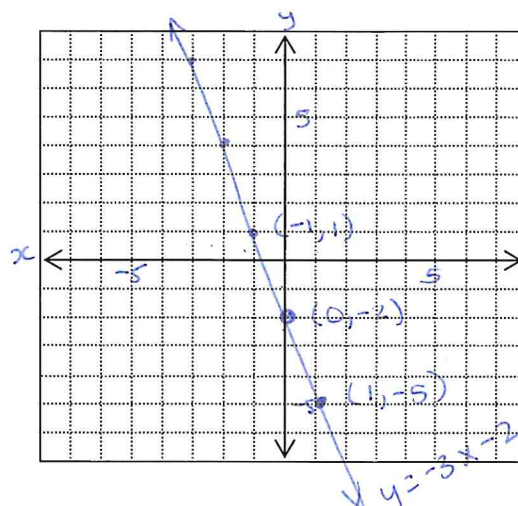
2. a) Sketch the graph for $y = -3x - 2$

- b) What is the slope?

$$m = -\frac{3}{1} \begin{array}{l} \swarrow \text{rise} \\ \searrow \text{run} \end{array}$$

- c) What is the y-intercept?

$$b = -2$$



3. a) Plot the following points on the grid and draw a line through the points. A $(-4, 5)$ and B $(2, 2)$

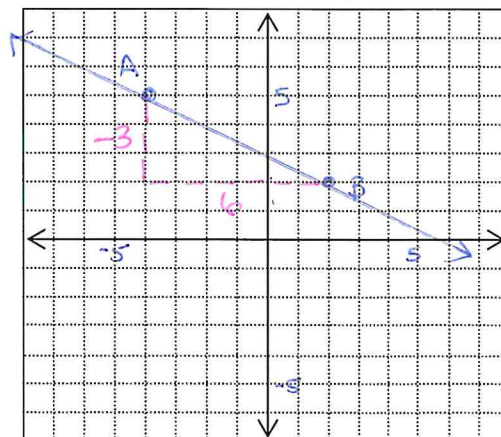
- b) From the graph, find m , the slope and b , the y-intercept of the line AB.

$$m = \frac{\text{rise}}{\text{run}} = \frac{-3}{4} = -\frac{3}{4}$$

$$b = 3$$

- c) Write the equation of the line in the form $y = mx + b$.

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



- d) Does the point $(8, 0)$ lie on the line (algebraically show your work)?

LS	RS
$= y$	$= -\frac{1}{2}x + 3$
$= 0$	$= -\frac{1}{2}(8) + 3$
	$= -4 + 3 = -1$

x

\therefore Does not lie on line

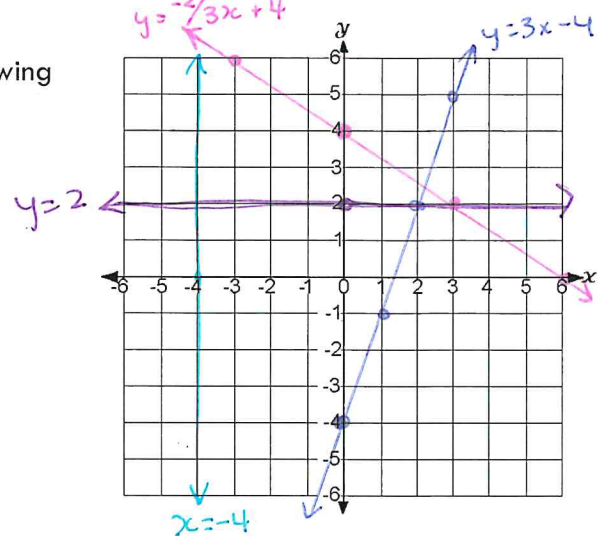
4. On the same set of axes, **graph** and **label** the following linear relations.

a) $y = 3x - 4$ —

b) $y = -\frac{2}{3}x + 4$ —

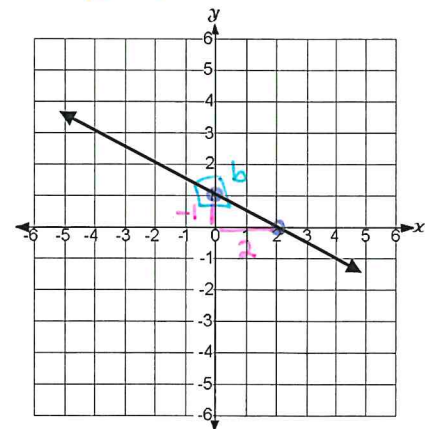
c) $y = 2$ —

d) $x = -4$



5. State the **equation** of the following line in $y = mx + b$ form.

$m = \frac{\text{rise}}{\text{run}}$ $b = 1$
 $m = -\frac{1}{2}$ $\therefore y = -\frac{1}{2}x + 1$



6. Find the equation of the line with slope = -5 and y-intercept = 2

$y = -5x + 2$

7. Find the equation of the line with slope -2 that passes through point $(3, -3)$

$y = mx + b$ m x, y
 $y = -2x + b$
 $-3 = -2(3) + b$ $-3 + b = b$
 $-3 = -6 + b$ $3 = b$
 $\therefore y = -2x + 3$

8. Find the equation of the line passing through points A $(-7, 6)$ and B $(4, 0)$.

$m = \frac{y_2 - y_1}{x_2 - x_1}$ x_1, y_1 x_2, y_2
 $= \frac{0 - 6}{4 - (-7)}$
 $m = -\frac{6}{11}$
 $y = mx + b$
 $0 = -\frac{6}{11}(4) + b$ $b = \frac{24}{11}$
 $0 = -\frac{24}{11} + b$
 $\therefore y = -\frac{6}{11}x + \frac{24}{11}$

9. Write each equation in slope y-intercept form and state the slope and y-intercept.

a) $2x + y + 7 = 0$

$m = -2$

$b = -7$

$y = -2x - 7$

b) $3x + 2y - 8 = 0$

$m = -3/2$

$b = 4$

$\frac{2y}{2} = \frac{-3x + 8}{2}$

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

10. The line $y = mx - 7$ goes through the point (3, 5). Find the value of m .

$5 = m(3) - 7$

$5 + 7 = 3m$

$\frac{12}{3} = \frac{3m}{3}$

$4 = m$

APPLICATION

11. A large pizza at Monster Pizza costs \$12.00 plus \$0.75 per topping.

a) Complete the following table of values.

# Toppings	Cost
0	12
1	12.75
2	13.50
3	14.25
4	15.00
5	15.75
6	16.50

b) Write an equation to represent this relationship.

$C = 0.75n + 12$

c) What IS the y-intercept?

12

d) What IS the slope of this relationship?

0.75

e) What does the y-intercept represent in THIS problem?

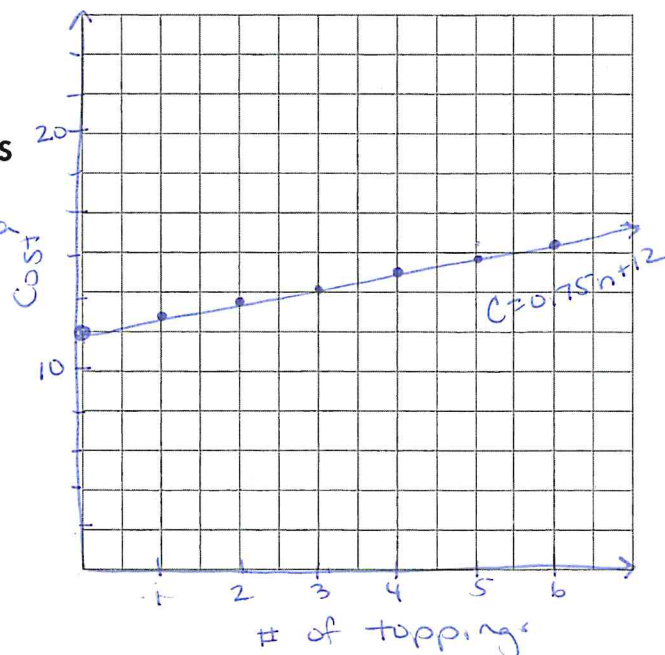
The cost of the pizza with no toppings

f) What does the slope represent in THIS problem?

The cost per topping

g) Graph this relationship [3 marks]

Don't forget to label ALL parts of your graph.



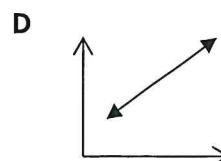
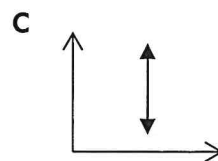
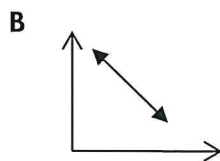
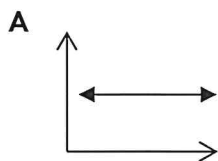
12. Match each type of slope with its correct image.

D Positive

B Negative

A Zero Slope

C Undefined



13. State an equation that:

a) has a **steeper slope** than $y = 3x + 4$

$$y = 4x + 4$$

b) is **parallel** to the line $y = -4x + 3$

$$y = -4x - 2$$

c) has an **undefined** slope

$$x = 6$$

d) has a **zero** slope

$$y = -3$$

14. Tyler borrows \$400 from his parents to buy a new snowboard. He plans to pay back a fixed amount of \$50 each week. The amount still owing is modeled by the equation $A = 400 - 50n$, where A is the amount still owed and n is the number of weeks since Tyler borrowed the money.

a) How many weeks will it take Tyler to pay off the loan?

$$A = 0$$

$$0 = 400 - 50n$$

$$n = ?$$

$$\begin{array}{r} -400 = -50n \\ -50 \quad -50 \end{array}$$

$$n = 8$$

\therefore It takes
8 weeks

b) How much will Tyler owe after 5 weeks?

$$A = ?$$

$$A = 400 - 50(5)$$

$$n = 5$$

$$A = 400 - 250$$

$$A = \$150$$

\therefore He will still owe
\$150

c) At the 5-week mark, how much longer will it take Tyler to pay off the loan?

$$8 - 5$$

$$= 3 \text{ weeks}$$

15. The Belhaven Banquet Hall charges a flat fee of \$900 and a per-person fee of \$45.

a) Write a linear equation to model the cost in dollars (C) of holding a banquet for n people.

$$C = 45n + 900$$

b) How much will it cost to hold a banquet for 85 people?

$$C = ?$$

$$C = 45(85) + 900$$

$$n = 85$$

$$C = \$4,728$$

\therefore It costs \$4,728 for
85 people

c) If you had a **maximum** budget of \$3400, how many people could attend a banquet?

$$C = 3400$$

$$3400 = 45n + 900$$

$$n = ?$$

$$3400 - 900 = 45n$$

$$\begin{array}{r} 2500 = 45n \\ 45 \quad 45 \end{array}$$

$$n = 55$$

\therefore 55 people could
attend