

**Important Definitions**

The **Standard Form** of a linear equation is in the form of

\_\_\_\_\_

**Conditions** of Standard Form:

1. The equation must equal to \_\_\_\_\_.
2. The values of A, B and C must be \_\_\_\_\_.
3. The coefficient A must be a \_\_\_\_\_ integer.

$3x - 2y + 18 = 0$  is in standard form where

$$A =$$

$$B =$$

$$C =$$

\_\_\_\_\_

Use the examples from (D) to describe the steps to convert a linear equation from  $y = mx + b$  into  $Ax + By + C = 0$ .

- (A) The following equations are NOT written in standard form. Explain which condition(s) are not satisfied in the following equations.

i.  $6y = -5x + 30$

ii.  $\frac{2}{3}x + 4y = 8$

- (B) Rearrange the equations in (A) in standard form.

$$6y = -5x + 30$$

$$\frac{2}{3}x + 4y = 8$$

- (C) Convert from standard form into slope y-intercept form.

$$2x - 3y + 21 = 0$$

- (D) Convert from slope y-intercept form into standard form.

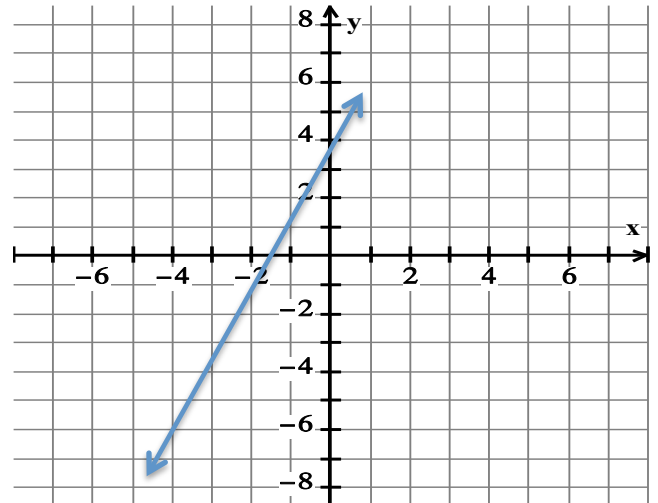
i.  $y = 3x - 2$

ii.  $y = \frac{3}{4}x + 6$

iii.  $y = -\frac{2}{5}x - 4$

(E) Consider the graph of the line  $10x - 4y + 20 = 0$

(i) Determine the coordinates of the x-intercept and the y-intercept from the graph.



x-intercept:

y-intercept:

(ii) Using the equation, develop an algebraic method to determine the:

x-intercept:

y-intercept:

### Important Definitions

**x-intercept:** Is the x-coordinate of the point where a line crosses (intercepts) the x-axis.

At this point the y-coordinate is ALWAYS 0.

**y-intercept:** Is the y-coordinate of the point where a line crosses (intercepts) the y-axis.

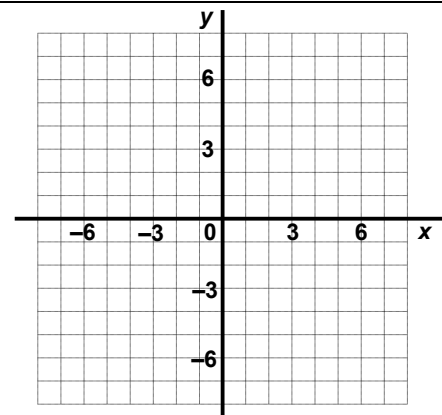
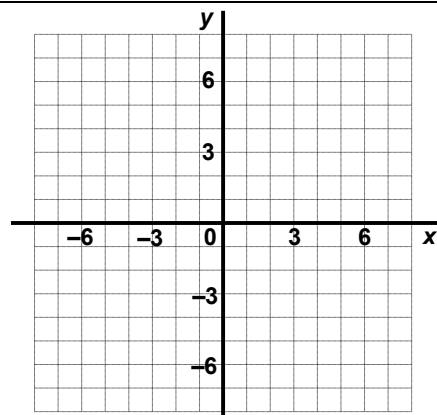
At this point the x-coordinate is ALWAYS 0.

### Sometimes to graph a line, it is easier to use the intercepts.

(F) Graph the lines below using the intercepts. Show your work.

$$2x - y = 6$$

$$5x + 3y + 15 = 0$$



# Why Does a Poor Man Drink Coffee ?

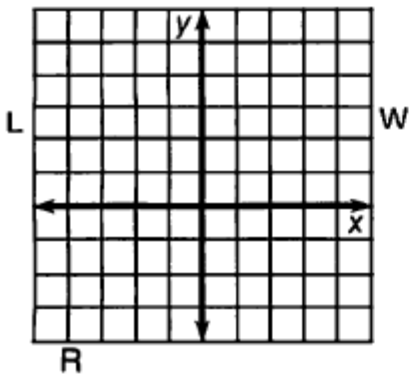
**Try This:** Use the intercept method to graph each equation, show your work in the space provided. The graph, if extended, will cross a letter. Print this letter in each box that contains the number of that exercise.

Answer Box:

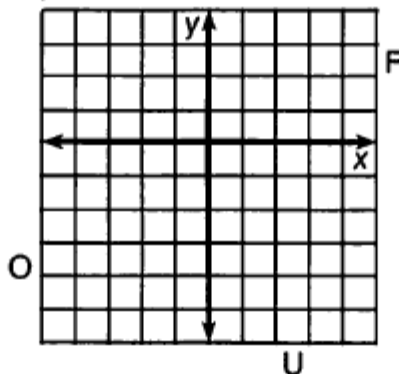
6	8	6	4	3	5	2	9	1	2	9	8	1	7	8	4
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Questions: For all 9 questions assume that the scales are in increment of 1.

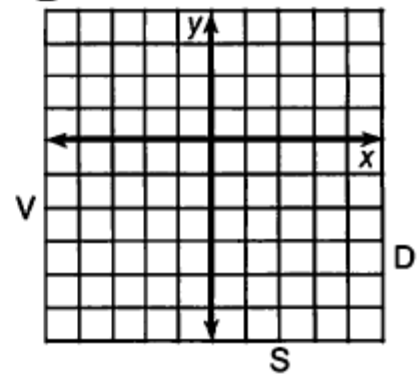
①  $-3x + 2y = 2$



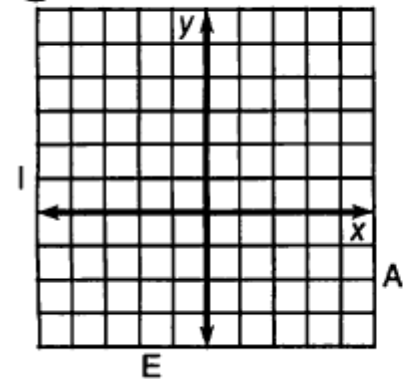
②  $x - 4y = 8$



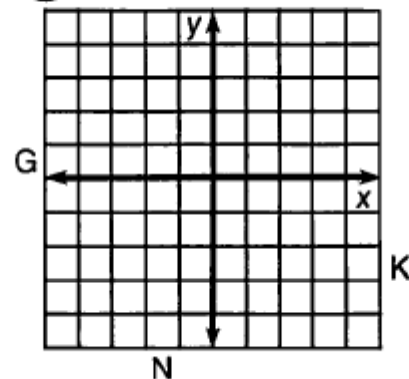
③  $2x + y = -3$



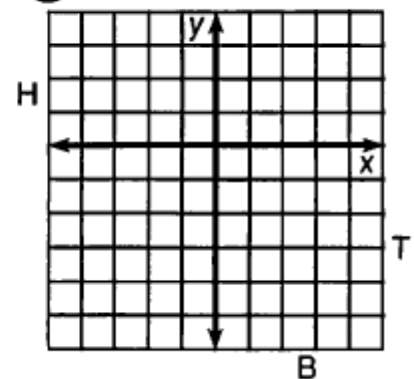
④  $2x + 3y = 6$



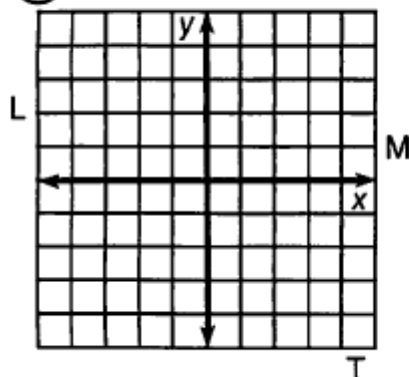
⑤  $3x - y = 1$



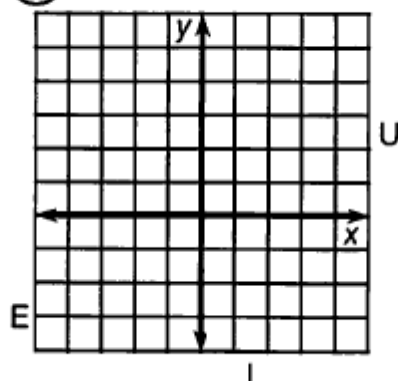
⑥  $-3x - 5y = 10$



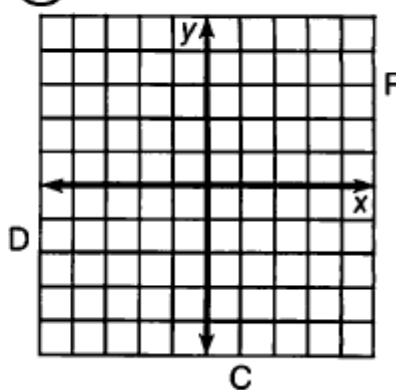
⑦  $4x + 3y = 0$



⑧  $2x - 2y + 5 = 0$



⑨  $y - 3 = 0$

**LEARNING GOALS**

- I can identify whether an equation is in standard form or not.
- I can rearrange an equation to convert between slope y-intercept form and standard form.
- I can determine the x and y intercepts when given the equation of a line.
- I can graph a line using the intercept method.

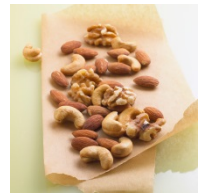
**(A)** A health food store is making a mix of nuts and raisins. Nuts are \$30/kg and raisins are \$10/kg. The total mix should cost \$150.

- i. What combinations of nuts and raisins cost \$150 if  $r$  represents the mass of raisins and  $n$  represents the mass of nuts? Use the table to right.

Mass of Nuts, $n$ (kg)	Mass of Raisins, $r$ (kg)

- ii. Write an equation representing the relation between the mass of nuts,  $n$ , and the mass of raisins,  $r$ , with the total cost of \$150.

- iii. If Isabella chose to purchase only nuts worth \$150, what mass of nuts can she purchase?



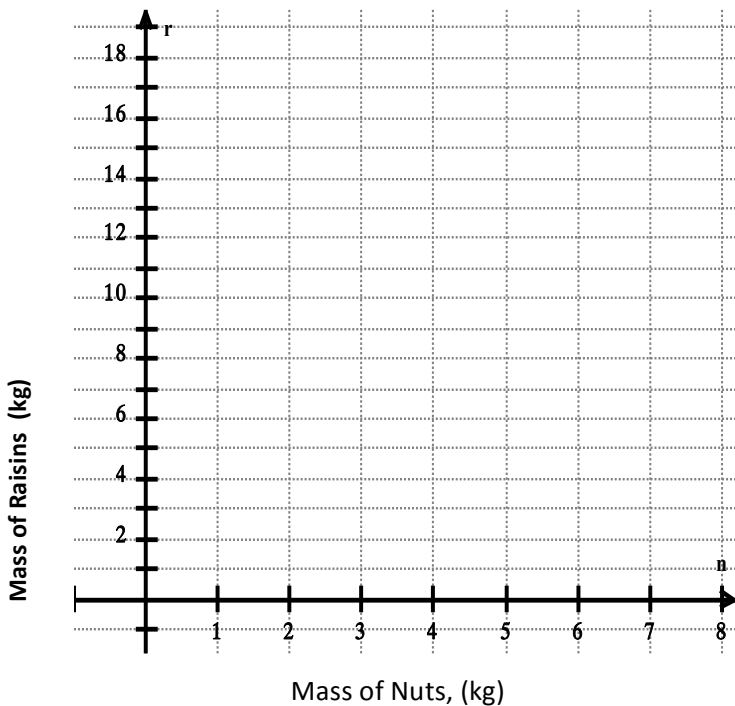
- iv. If Isabella chose to purchase only raisins worth \$150, what mass of raisins can she purchase?

- v. Add the values found in (iii) & (iv) to your table of values and graph the relation to the left.

- vi. Rewrite your equation found in (ii) in slope y-intercept form,  $r = mn + b$  (Isolate for  $r$  in terms of  $n$ ).

- vii. What does the slope represent?

- ix. What does the x-intercept represent?



- viii. What does the y-intercept represent?

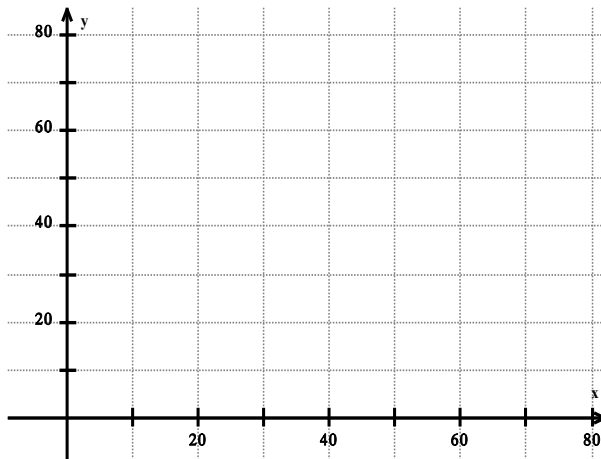
**(B)** Erik and Cameron work part time at Cycle Solutions. The owner will pay them \$130 a day to fix bicycles. For every bike gear they fix they will earn \$3.25 and for every wheel they put on a bike they will earn \$2.

i. Determine four possible ways they can earn the \$130/day by fixing the gears and wheels on bicycles. Add these values to a table of values.

Number of Gears, <i>g</i>	Number of wheels, <i>w</i>

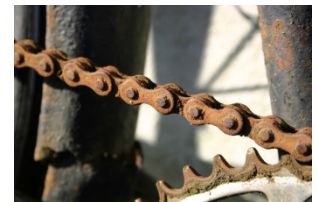
ii. Develop an equation using your findings from (i) if *g* represents the # of gears, and *w* represents the # of wheels fixed.

iii. Graph your relation on the grid provided. Does it matter which variable goes on the x-axis? Explain.



iv. Rewrite your equation in the form  $y = mx + b$ . (That is isolate for your dependent variable).

v. Interpret the value of the slope for this situation.



vi. Interpret the value of the x-intercept and y-intercept for this situation.