U6D2_T Linear Equation in Standard Form

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PDF

U6D2_T
Linear Eq...

U6D2

Warm up:

$y = mx + b$

Given the linear equation y = -2x + 5,

a) identify the slope and y-intercept

$b = 5$ $m = -2$

$= \dfrac{-2}{1}$ rise   down 2

run   right 1

b) graph

$y = -2x + 5$
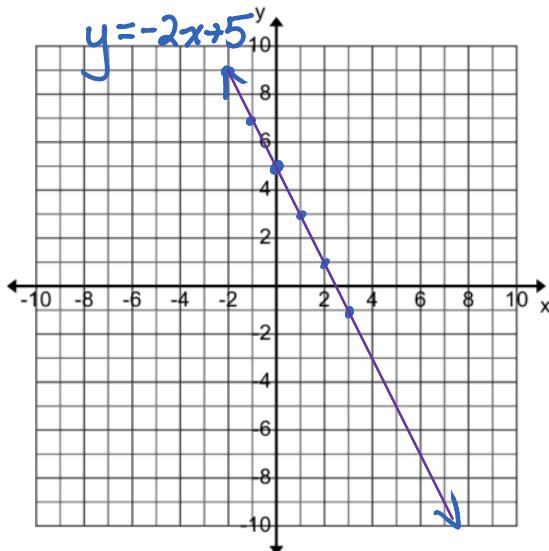
Equation of a Line in Standard Form

The form of a linear equation that we have focused on so far is the slope y-intercept form:

$$y = mx + b$$

Another form of a linear equation that is used is called the Standard Form. Standard form of a linear equation is:

$$Ax + By + C = 0$$

- A, B, C are __all integers__
  (not __fractions or decimals__)
- A & B are not both equal to __zero__
- The coefficient on the leading term (First term) is __positive__
- Right side of the equation equals __zero__

U6D2

Example 1: Which equations are in standard form?

a) $3x - 4y - 3 = 0$
$A = 3, B = -4, C = -3$
Yes!

b) $y = 2x - 3$
No!
This is slope/y-int. form

c) $2y + 5x - 7 = 0$
No!
$5x + 2y - 7 = 0$ is standard form

d) $0 = 3x - y + 1$
No!
$3x - y + 1 = 0$

e) $x - 2 = 0$
$A = 1, B = 0, C = -2$
Yes!
vertical line $x = 2$
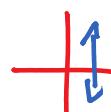
f) $y + \dfrac{7}{2} = 0$
No! Fraction
LCM is 2 So, multiply by 2
$2y + 7 = 0$ is standard form
horizontal line $y = -3.5$

g) $-y + 5 = 0$
No!
$y - 5 = 0$
$y = 5$

Example 2: Express each equation in y=mx+b form. State the slope and y-intercept:

a) $4x + 6y + 8 = 0$
$4x + 6y + 8 - 4x - 8 = 0 - 4x - 8$
$\dfrac{6y}{6} = \dfrac{-4x}{6} - \dfrac{8}{6}$
$y = -\dfrac{2}{3}x - \dfrac{4}{3}$
$m = -\dfrac{2}{3}, b = -\dfrac{4}{3}$

b) $2x - 2y - 6 = 0$
$-2x$ $+6$ $-2x+6$
$-2y = -2x + 6$
$\dfrac{-2}{-2}y = \dfrac{-2}{-2}x + \dfrac{6}{-2}$
$y = x - 3$
$m = 1 \quad b = -3$

Example 3:

Express each equation in Standard form:

a) $y = 3x + 2$

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

b) $y = -4x + 6$ $^{-y}$

$$-4x - y + 6 = 0$$
$$4x + y - 6 = 0$$

c) $y = \dfrac{5}{2}x - 1$

$$\frac{5}{2}x - y - 1 = 0$$

Lcm 2
* multiply every term by 2.

$$5x - 2y - 2 = 0$$

Example 4: The Tent-All Company rents tents to campers and charges according to the equation, $10d - C + 50 = 0$, where C is the cost in dollars to rent which depends on d, the number of days rented.

a) Express the equation in slope y-intercept form

$$-C = -10d - 50$$
$$C = 10d + 50$$

b) Identify the fixed and the variable costs.

Fixed Cost is $50

Variable Cost is $10

c) Graph the relation.

d) What is the rental cost if a tent is rented for 7 days?

$$C = 10(7) + 50$$
$$C = 70 + 50$$
$$C = 120$$
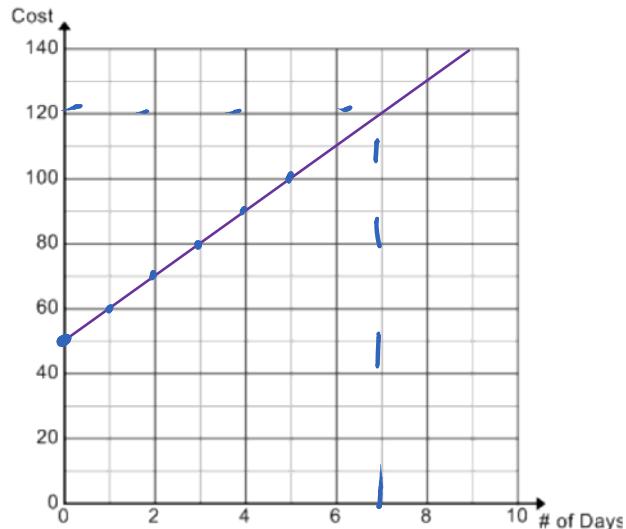
∴ it will cost $120 for 7 days.