FMPC10

LINEAR EQUTIONS SUMMARY

Answers

- There are four different forms of the equation of a line

Form	Slope-Intercept	General	Standard	Slope-Point
Equation	$y=mx+b$	$Ax+By+C=0$ *	$Ax+By=C$	$y-y_1=m(x-x_1)$
Meaning	m = slope b = y-intercept $(0,b)$	* exception when $C=0$ $Ax+By=0$ they look the same	$Ax+By=0$	m = slope (x_1,y_1) = coordinates of the known point
Rules	→ there is only one "y" and it must be positive	• A, B can't be zero at the same time • A is a whole number ⇒ A is not a fraction, negative, decimal	• A, B, C are integers • A, B not both zero at the same time • $A \geq 0$	• y is not negative • there is only one "y"

1. Determine the form of the given equation;
   a. Slope-Intercept
   b. General
   c. Standard
   d. Slope-Point
   e. Neither

	Equation	Form		Equation	Form
1	$y = 3x + 0$	Slope- Interapt	7	$x - 4y = -5$	Standard
2	$3x - 4y = 12$	Standard	8	$-x + 5y - 3 = 0$	Neither
3	$9x - y = 0$	General, Standard ($C = 0$)	9	$7y + 4z + 1 = 0$	Neither
4	$y + 3 = 0.4(x - 1)$	Slope-Point	10	$y - 2 = 1(x - 3)$	Slope-Point
5	$x + 3 = 2(y + 5)$	Neither	11	$0.4x + 3y - 6 = 0$	Neither
6	$y = -0.5x + 10.7$	Slope-Interapt	12	$x + 7y - 4 = 0$	General

2. Express equation 2 in slope-intercept form. Show your work.

$$3x - 4y = 12$$
$$-3x \qquad -3x$$
$$-4y = -3x + 12$$
$$\frac{-4y}{-4} = \frac{-3x}{-4} + \frac{12}{-4}$$
$$\boxed{y = \frac{3}{4}x - 3}$$

3. Express equation 10 in slope-intercept form. Show your work.

$y-2=1(x-3)$

$y-2=1x-3$

$+2 \quad +2$

$y=1x-3+2$

$\boxed{y=1x-1} = \boxed{y=x-1}$

4. Express equation 12 in slope-intercept form. Show your work.

$x+7y-4=0$

$+4 \quad +4$

$x+7y=4$

$-x \quad -x$

$7y=-1x+4$

$\frac{7y}{7} \quad \frac{-1x}{7} \quad \frac{4}{7}$

$\boxed{y=\frac{-1}{7}x+\frac{4}{7}}$

5. Express equation 6 is general form. Show your work.

$y=-0.5x+10.7$

$+0.5x \quad +0.5x$

$0.5x+y=10.7$

$-10.7 \quad -10.7$

$0.5x+y-10.7=0$

$x^2 \quad x^2 \quad x^2$

$0.5x+1y-10.7=0$

$\boxed{1x+2y-21.4=0}$

OR

$\boxed{x+2y-21.4=0}$

6. Express equation 5 in standard form.

$x+3 = 2(y+5)$

$x+3 = 2y+10$

$-2y \quad -2y$

$x-2y+3 = 10$

$-3 \quad -3$

$\boxed{x-2y=7}$

New

7. Determine whether point A (-15,8) is on the graph of the equation $y = \frac{2}{5}x + 14$.

$x \quad y$

Substitute $x = -15$ and $y = 8$ into the given equation and see if LS = RS. If LS = RS the point is on the graph.

$8 = \frac{2}{5}(-15) + 14$

$8 = \frac{-30}{5} + 14$

$8 = -6 + 14$

$8 = 8$

LS = RS ✓

∴ Point A $(-15, 8)$ is on the graph of $y = \frac{2}{5}x + 14$

New

8. Determine whether point B (3,-2) is on the graph of the equation 2x-5y = 18.

$\quad\quad x \quad y$

$2x - 5y = 18$

$2(3) - 5(-2) = 18$

$6 - (-10) = 18$

$6 + 10 = 18$

$16 \neq 18$

$LS \neq RS$

$\therefore$ Point B $(3,-2)$ is not on the graph of $2x-5y=18$.

9. Find the x-intercept of $y = \frac{1}{2}x - 9$.

$y = 0$

$0 = \frac{1}{2}x - 9$

$+9 \quad\quad +9$

$\frac{9}{\frac{1}{2}} = \frac{\frac{1}{2}x}{\frac{1}{2}}$

$18 = x$

$\therefore$ x-int. is $(18, 0)$.

10. Find the y-intercept of $3x + 5y - 8 = 0$.

$x = 0$

$3(0) + 5y - 8 = 0$

$0 + 5y - 8 = 0$

$+8 \quad +8$

$\frac{5y}{5} = \frac{8}{5}$

$\rightarrow y = \frac{8}{5}$

$\therefore$ y-intercept is $(0, 8/5)$.

11. Write an equation in slope-intercept form for a line that has its x-intercept identical to its y-intercept and is parallel to $y = \frac{1}{3}x + 6$. $\rightarrow$ // lines $\Rightarrow$ same slope $(0,0)$

$\boxed{y = \frac{1}{3}x + 0}$ OR $\boxed{y = \frac{1}{3}x}$

12. Write an equation in slope-point from for a line that is perpendicular to $y = \frac{1}{3}x + 6$ and passes through point P (-2,5).

$\rightarrow m = \frac{1}{3}$

$\rightarrow m_{\perp} = \frac{-3}{1} = -3$

$P(-2, 5)$
$x_1 \quad y_1$

$y - y_1 = m(x - x_1)$

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

$\therefore \boxed{y - 5 = -3(x + 2)}$