

### Equations of Lines

Convert the following equations into slope - intercept form. Identify the slopes!

1.  $x - 3y = 6$

$$\frac{-3y}{-3} = \frac{-x+6}{-3}$$

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

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

2.  $9x + 7y = 7$

$$\frac{7y}{7} = \frac{-9x+7}{7}$$

$m = -\frac{9}{7}$

$y = -\frac{9}{7}x + 1$

3.  $4x + y = 1$

$y = -4x + 1$

$m = -4$

4.  $6x + 5y = -15$

$$\frac{5y}{5} = \frac{-6x-15}{5}$$

$y = -\frac{6}{5}x - 3$

$m = -\frac{6}{5}$

Write the equations of the lines passing through the following points.

5. (0, 3) and (5, 3)

$$m = \frac{3-3}{5-0} = \frac{0}{5} = 0$$

$y = 3$

6. (4, -1) and (3, -4)

$$m = \frac{-4+1}{3-4} = \frac{-3}{-1} = 3$$

$-1 = 3(4) + b$

$-1 = 12 + b$

$b = -13$

$y = 3x - 13$

7. (6, 2) and (10, 4)

$$m = \frac{4-2}{10-6} = \frac{2}{4} = \frac{1}{2}$$

$2 = \frac{1}{2}(6) + b$

$2 = 3 + b$

$b = -1$

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

8. (-2, -4) and (-7, -6)

$$m = \frac{-6+4}{-7+2} = \frac{-2}{-5} = \frac{2}{5}$$

$-4 = \frac{2}{5}(-2) + b$

$-4 = -\frac{4}{5} + b$

$b = -\frac{16}{5}$

$y = \frac{2}{5}x - \frac{16}{5}$

9. (4, -5) and (8, 1)

$$m = \frac{1+5}{8-4} = \frac{6}{4} = \frac{3}{2}$$

$1 = \frac{3}{2}(8) + b$

$1 = 12 + b$

$b = -11$

$y = \frac{3}{2}x - 11$

10. (2, 5) and (2, 9)

$$m = \frac{9-5}{2-2} = \frac{4}{0}$$

undef.

$x = 2$

Change the following equations into Standard Form ( $Ax + By = C$ )

11.  $6y = -2x + 5$

$2x + 6y = 5$

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

$$-3\left(-\frac{2}{3}x + y = -1\right)$$

$2x - 3y = 3$

13.  $y = \frac{4}{5}x + 5$

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

$4x - 5y = -25$

Points (Find the slope)	Slope	Slope intercept form $y = mx + b$	Standard Form $Ax + By = C$
$(-2, 5)$ and $(7, 4)$	$\text{Slope} = \frac{5-4}{-2-7}$ $= \frac{1}{-9}$	$5 = -\frac{1}{9}(-2) + b$ $5 = \frac{2}{9} + b$ $b = \frac{43}{9}$ $y = -\frac{1}{9}x + \frac{43}{9}$	$\left(\frac{1}{9}x + y = \frac{43}{9}\right) \cdot 9$ $x + 9y = 43$
$(9, 1)$ and $(6, 5)$	$\text{Slope} = \frac{5-1}{6-9}$ $= \frac{4}{-3}$	$5 = -\frac{4}{3}(6) + b$ $5 = -8 + b$ $b = 13$ $y = -\frac{4}{3}x + 13$	$\left(\frac{4}{3}x + y = 13\right) \cdot 3$ $4x + 3y = 39$
$(-3, 6)$ and $(8, 6)$	$\text{Slope} = \frac{6-6}{8+3}$ $= 0$	$y = 6$	$0x + y = 6$
$(4, 5)$ and $(4, -7)$	$\text{Slope} = \frac{5+7}{4-4}$ $\frac{12}{0}$ <p>undef.</p>	$x = 4$	$x + 0y = 4$
$(-2, -2)$ and $(8, -4)$	$\text{Slope} = \frac{-2+4}{-2-8}$ $= \frac{2}{-10} = -\frac{1}{5}$	$-2 = -\frac{1}{5}(-2) + b$ $-2 = \frac{2}{5} + b$ $-\frac{12}{5} = b$ $y = -\frac{1}{5}x - \frac{12}{5}$	$\left(\frac{1}{5}x + y = -\frac{12}{5}\right) \cdot 5$ $x + 5y = -12$

$$y = -\frac{1}{5}x - \frac{12}{5}$$