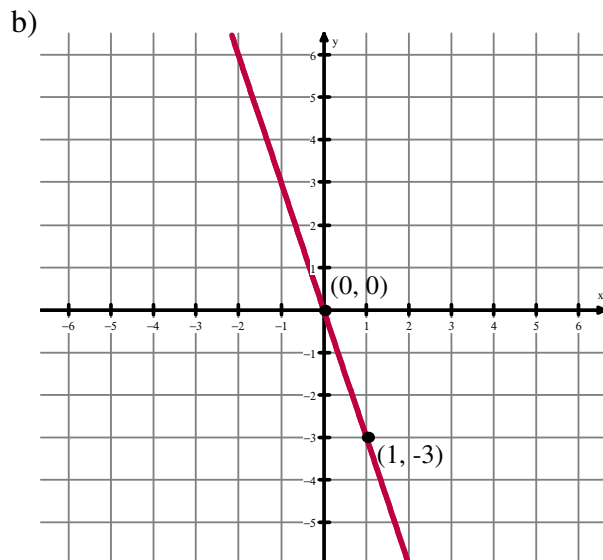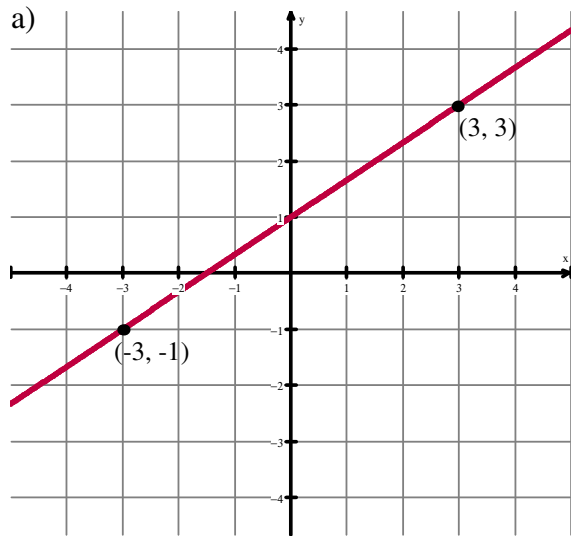# Equation of a Line Given Two Points

Determine the equation of the line that passes through each pair of points.

a)

b)

MPM 1D1

2 Determine the equation of the line that passes through each pair of points.

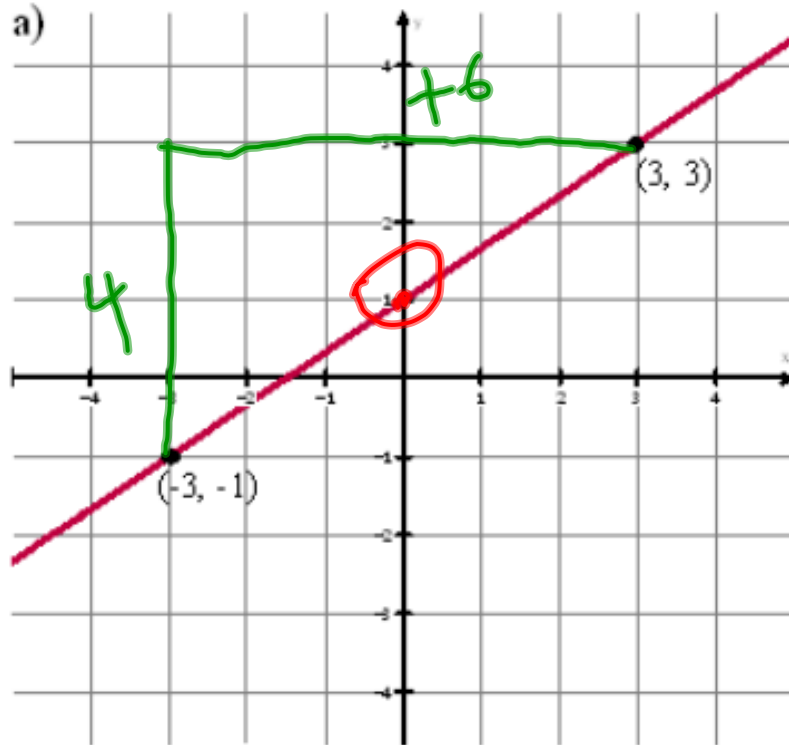a)   (3, 4) and (6, 10)   b)   (5, 2) and (-1, 3)

c)   (-2, 5) and (3, -5)   d)   x-intercept of 3
                                                                           and y-intercept of -5

The Equation of a Line using Two Points

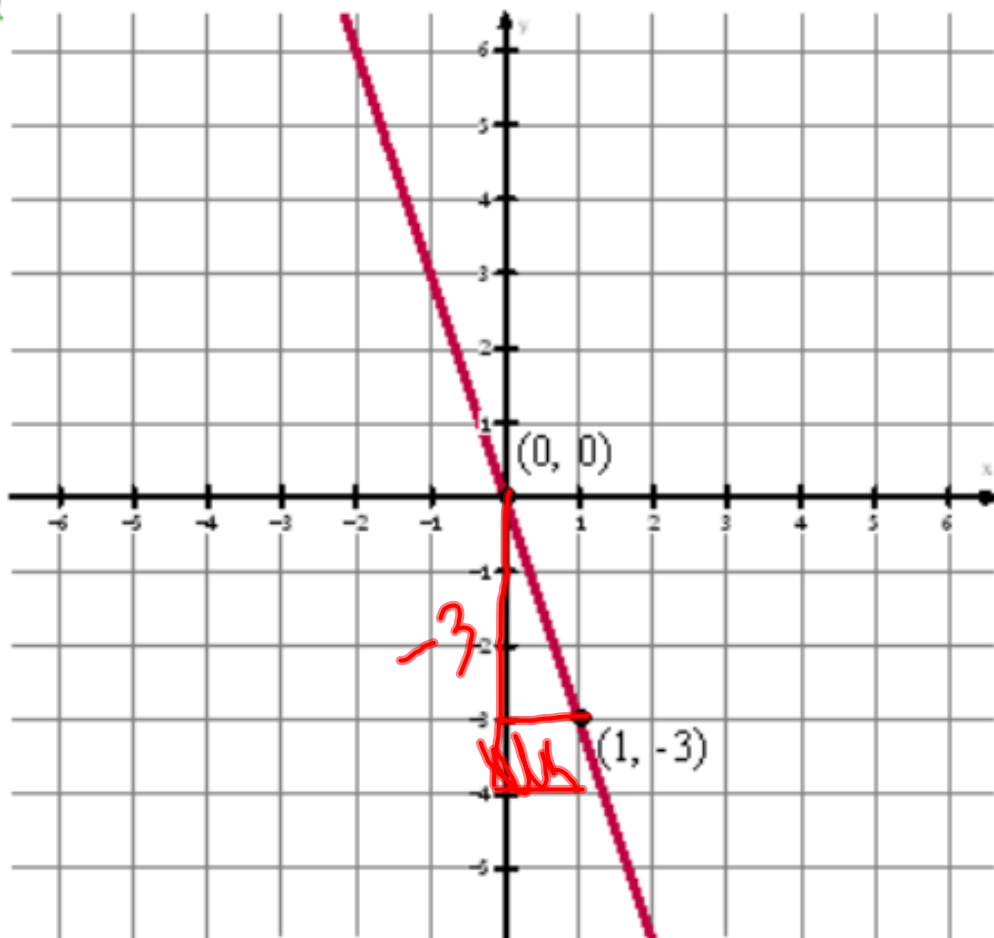Determine the equation of each line passing through the given points.

a)

(3, 3)

(-3, -1)

+6

4

$$\text{Find } m$$

$$m = \frac{rise}{run}$$

$$= \frac{4}{6}$$

$$= \frac{2}{3}$$

$$\text{Find } b$$

$$b = 1$$

$$\therefore y = \frac{2}{3}x + 1$$

b)

Find m

$m = -3$

Find b

$b = 0$

$y = -3x$

(0, 0)

-3

rise

(1, -3)

2

Determine the equation of the line that passes through each set of points.

a)   (3, 4) and (6, 10)

Find m $m = \frac{\Delta y}{\Delta x}$ Find b

x	y
3	4
6	10

$+3 \nearrow \searrow +6$

$= \frac{6}{3}$

$m = 2$

① $y = 2x + b$
② $(4) = 2(3) + b$
③ $4 = 6 + b$

$4 - 6 = b$

$-2 = b$

$\therefore y = 2x - 2$

b)   (5, 2) and (-1, 3)

Find m:

x	y
5	2
-1	3

$-6 \nwarrow \searrow +1$

$m = \frac{1}{-6}$

$m = -\frac{1}{6}$

Find b:

① $y = -\frac{1}{6}x + b$

② $(3) = -\frac{1}{6}\left(\frac{-1}{1}\right) + b$

③ $3 = \frac{+1}{6} + b$

$3 - \frac{1}{6} = b$

$\frac{18}{6} - \frac{1}{6} = b$

$\frac{17}{6} = b$

$\therefore y = -\frac{1}{6}x + \frac{17}{6}$

c)   (-2, 5) and (3, -5)

Find m:

x	y
-2	5
+5 3	-5

$\rangle -10$

$m = \dfrac{-10}{5} = -2$

Find b:

$y = -2x + b$

$(5) = -2(-2) + b$

$5 = 4 + b$

$\boxed{1 = b}$

$\therefore y = -2x + 1$

d)   x-intercept of 3
        y-intercept of -5

$(3, 0) \quad (0, -5)$

Find m

x	y
3	0
0	-5

$-3 \langle \qquad \rangle -5$

$m = \dfrac{-5}{-3} = \boxed{\dfrac{5}{3}}$

Find b

$b = -5$

$\therefore y = \dfrac{5}{3}x - 5$