

# Slope of a Line

**The slope** of a line is the measure of the **inclination** of the line.



Slope Formula

Determine the missing coordinates in the following points, given the slope of the line between them.

a) The slope between the point A(2, 7) and B(5, y) is  $\frac{4}{3}$ .

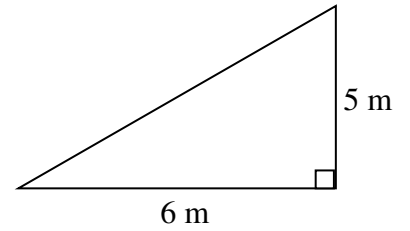
b) The slope between the point C(8, 12) and D(x, 7) is -5.

2 Determine the slope of the line that passes through the following points.

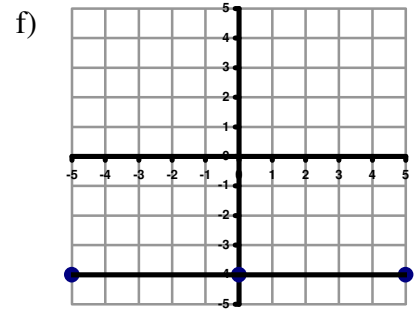
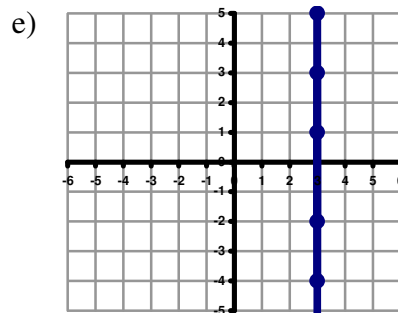
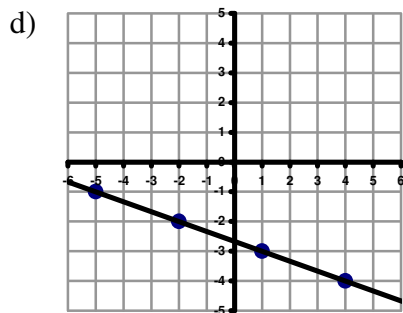
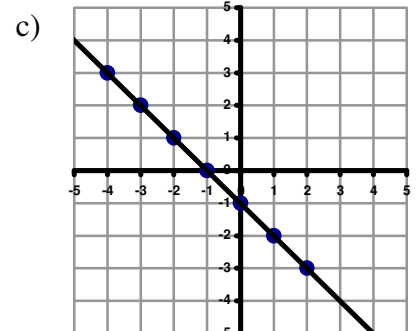
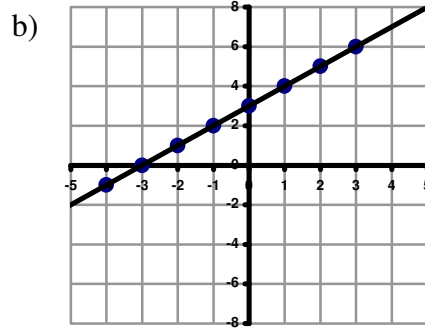
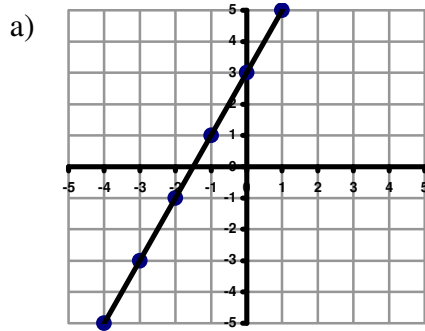
a) A (3,2) and B (7,1)

b) G (7,-3) and H (-2,-5)

c)



3 Determine the slope of each of the following lines.



Determine the missing coordinates in the following points, given the slope of the line between them.

a) The slope between the point A(2, 7) and B(5, y) is  $\frac{4}{3}$ .

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$\frac{4}{3} = \frac{y - 7}{5 - 2}$$

~~$$\frac{4}{3} = \frac{y - 7}{3}$$~~

$$12 = 3y - 21$$

$$33 = 3y$$

$$\boxed{11 = y}$$

b) The slope between the point C(8, 12) and D(x, 7) is -5.

$$x - 8 \quad \begin{array}{c|c} x & y \\ \hline 8 & 12 \\ x & 7 \end{array} \quad \frac{7 - 12}{\phantom{x}} = -5$$

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

~~$$\frac{-5}{1} = \frac{-5}{x - 8}$$~~

$$-5x + 40 = -5x + 40$$

$$-5x = -45$$

$$\boxed{x = 9}$$

### The Slope of a Line

The slope of a line measures how steep the line is (angle of inclination).



<p>Slope Formula</p> $m = \frac{\text{rise}}{\text{run}} = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1}$
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2

Determine the slope between each set of points (and diagram) below.

a) A (3,2) and B (7,1)

$$\begin{aligned}
 m &= \frac{y_2 - y_1}{x_2 - x_1} \\
 &= \frac{1 - 2}{7 - 3} \\
 &= \frac{-1}{4}
 \end{aligned}$$

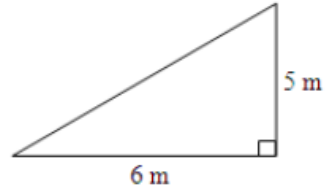
b) G (7,-3) and H (-2,-5)

x	y
7	-3
-2	-5

$-9 < \quad > -2$

$$\begin{aligned}
 m &= \frac{\Delta y}{\Delta x} = \frac{-2}{-9} \\
 &= \frac{2}{9}
 \end{aligned}$$

c)

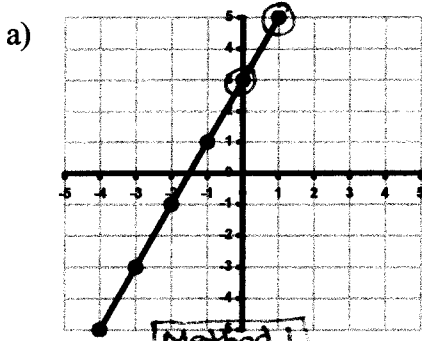


$$\begin{aligned}
 m &= \frac{\text{rise}}{\text{run}} \\
 m &= \frac{5}{6}
 \end{aligned}$$

# Slope Formula

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

3 Determine the slope and y-intercept of each of the following lines:



Method 1

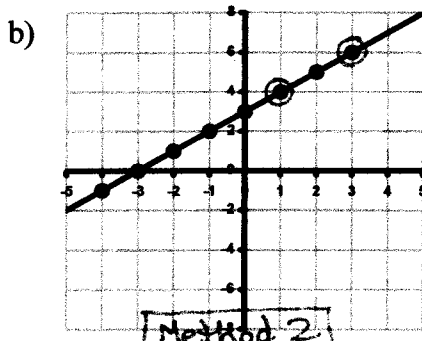
X	Y
0	3
1	5

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

$$m = \frac{2}{1}$$

m = 2

y-int = 3



Method 2

(1, 4)	(3, 6)
$x_1, y_1$	$x_2, y_2$

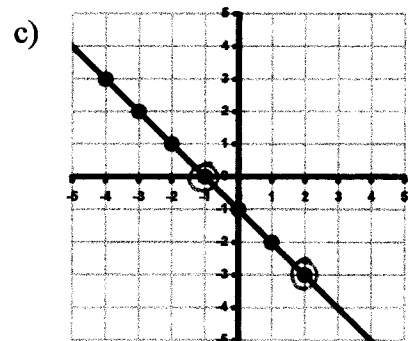
$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{6 - 4}{3 - 1}$$

$$m = \frac{2}{2}$$

m = 1

b = 3



(-1, 0)	(2, -3)
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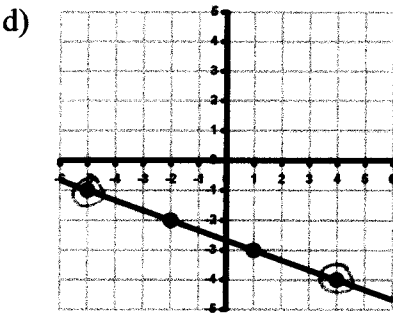
$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{-3 - 0}{2 - (-1)}$$

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

m = -1

b = -1



(-5, -1)	(4, -4)
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$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{-4 - (-1)}{4 - (-5)}$$

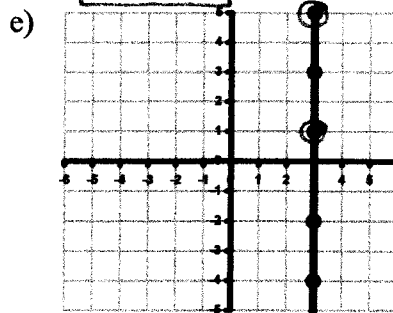
$$m = \frac{-4 + 1}{4 + 5}$$

$$m = \frac{-3}{9}$$

m = -1/3

b = -2.6 estimate

b = -2 2/3 actual



(3, 1)	(3, 5)
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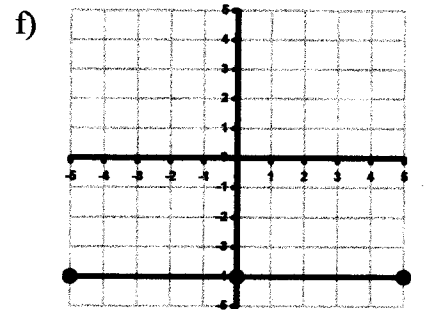
$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{5 - 1}{3 - 3}$$

$$m = \frac{4}{0}$$

Undefined or m = infinity

b = None



(0, -4)	(5, -4)
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$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{-4 - (-4)}{5 - 0}$$

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

m = 0

b = 4

\* Use your favourite method \*