

Geometry Notes Day 1

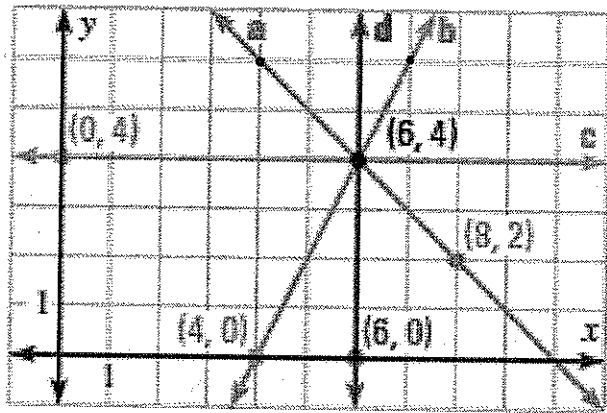
Name Key

3.4 Find and Use Slopes of Lines

How to find a slope:

Given points on a graph:	Given 2 ordered pairs (x_1, y_1) (x_2, y_2)
$\text{slope} = \frac{\text{change in } y}{\text{change in } x}$ <p>*just count the changes</p>	<p>*just use the formula</p> $m = \frac{y_1 - y_2}{x_1 - x_2}$

Find the slope for each of the following lines:



- line a $-\frac{2}{2} = -1$ (circled -1)
- line b $\frac{2}{1} = 2$ (circled 2)
- line c $\frac{0}{2} = 0$ (circled 0)
- line d $\frac{?}{0} = \text{und.}$ (circled und.)

Find the slope of the line that passes through each pair of points:

<p>5. $(2, 1)$ $(8, 9)$</p> $m = \frac{9-1}{8-2} = \frac{8}{6}$ <p>(circled $m = \frac{4}{3}$)</p>	<p>6. $(-10, 7)$ $(-20, 8)$</p> $m = \frac{8-7}{-20+10} = \frac{1}{-10}$ <p>(circled $m = -\frac{1}{10}$)</p>	<p>7. $(5, 1)$ $(8, 1)$</p> $m = \frac{1-1}{8-5} = \frac{0}{3}$ <p>(circled $m = 0$) *horizontal</p>	<p>8. $(2, 1)$ $(2, 9)$</p> $m = \frac{9-1}{2-2} = \frac{8}{0}$ <p>(circled $m = \text{und.}$) *vertical</p>
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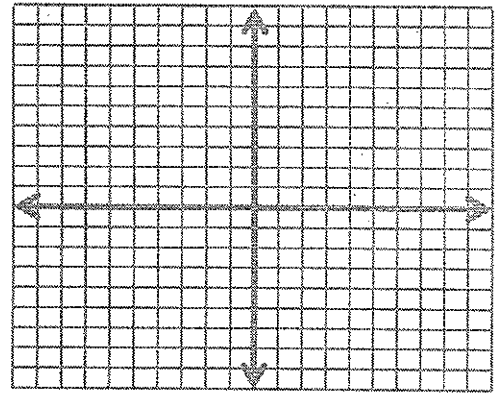
SUMMARY:

The ratio of vertical change to horizontal change is known as slope. We use the letter m to represent the term slope. The slope describes the rate of change or the steepness of a line. A line rising from left to right has a positive slope. A line falling from left to right has a negative slope. All horizontal lines have a zero slope. All vertical lines have an undefined slope.

Tell which line through the given points is steeper.

11. Line 1: $(-2, 3)$ and $(3, 5)$ $m_1 = \frac{5-3}{3-(-2)} = \frac{2}{5}$
 Line 2: $(3, 1)$ and $(6, 5)$ $m_2 = \frac{5-1}{6-3} = \frac{4}{3}$

Line 2 is steeper



12. Line 1: $(-4, 4)$ and $(-6, 10)$ $m_1 = \frac{10-4}{-6-(-4)} = \frac{6}{-2} = -3$
 Line 2: $(4, 2)$ and $(7, 8)$ $m_2 = \frac{8-2}{7-4} = \frac{6}{3} = 2$

Line 1 is steeper

The Steeper Line has the slope with the greater

absolute value

Determine the value of the missing coordinate so that a line passing through the given points would have the given slope.

13. $(10, y)$ $(3, 4)$ $m = -\frac{2}{7}$

$$\frac{y-4}{10-3} = -\frac{2}{7}$$

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

$$7(y-4) = 7(-2)$$

$$7y - 28 = -14$$

$$7y = +14$$

$$y = 2$$

$y = 2$

14. $(4, 19)$ $(x, 1)$ $m = 6$

$$\frac{19-1}{4-x} = \frac{6}{1}$$

$$\frac{18}{4-x} = \frac{6}{1}$$

$$18 = 6(4-x)$$

$$18 = 24 - 6x$$

$$-6 = -6x$$

$$1 = x$$

$x = 1$

15. $(5, 3)$ $(7, y)$ $m = 0$

$$\frac{3-y}{5-7} = \frac{0}{1}$$

$$3-y = 0(-2)$$

$$3-y = 0$$

$$-y = -3$$

$$y = 3$$

$y = 3$

16. $(10, -4)$ $(x, 7)$ $m = \text{undefined}$

$$\frac{7+4}{x-10} = \frac{1}{0}$$

$$\frac{11}{x-10} = \frac{1}{0}$$

$$0(11) = 1(x-10)$$

$$0 = x - 10$$

$$10 = x$$

$x = 10$