

Slopes of Parallel and Perpendicular Lines

Directions: Following the instructions below and use the graph provided.

1. Graph A(3,-2) and B(1,4). Connect the points to make \overline{AB} (Line segment AB)

2. Graph C(9,-2) and D(7,4). Connect the points to make \overline{CD} (Line segment CD)

3. What do you notice about the two line segments? _____

4. Find the slope of both \overline{AB} and \overline{CD} .

Slope of \overline{AB} = _____ Slope of \overline{CD} = _____

What do you notice? _____

Will that always happen? Explain _____

5. Graph E(-2,3) and F(4,5). Connect the points to make \overline{EF} (Line segment EF)

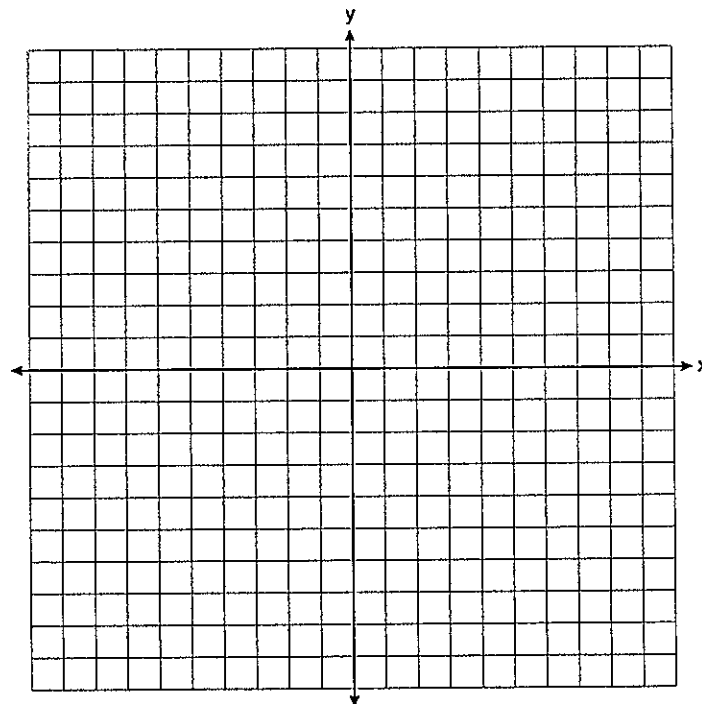
6. What do you notice about line segments \overline{AB} and \overline{EF} ? _____

7. Find the slope of \overline{EF} .

Slope of \overline{AB} = _____ Slope of \overline{EF} = _____

What do you notice? _____

Will that always happen? Explain _____



• If two lines are parallel, then their slopes are _____.

Examples:

1) Write the equation of a line parallel to $y = 3x - 5$. _____

2) Write the equation of a line parallel to $18x + 2y = 10$ _____

3) Which line is parallel to $y = \frac{4}{7}x + 7$?

- (a) $y = \frac{7}{4}x + 7$
- (b) $y = -\frac{4}{7}x + 2$
- (c) $y = -\frac{7}{4}x - 7$
- (d) $y = \frac{4}{7}x + 5$

4) Which line is parallel to $9 - 3y = 15x$?

- (a) $y = 15x + 3$
- (b) $y = 15x - 9$
- (c) $y = -5x + 5$
- (d) $y = 5x + 3$

5) If two lines are parallel and the slope of one line is w , what is the sum of their slopes?

- (a) w^2
- (b) $w + x$
- (c) $w + 2$
- (d) $2w$

• If two lines are perpendicular, then their slopes are _____.

Examples:

1) Write the equation of a line that is perpendicular to $y = \frac{3}{5}x + 10$. _____

2) Write the equation of a line that is perpendicular to $y = -\frac{2}{7}x + 10$. _____

3) Which line is perpendicular to $y = \frac{1}{4}x - 8$?

- (a) $y = -\frac{1}{4}x - 8$
- (b) $y = -4x - 10$
- (c) $y = \frac{1}{4}x - 10$
- (d) $y = 4x - 8$

4) If Line A is represented by $y = \frac{3}{7}x + 4$ and Line B is represented by

$y = -\frac{7}{3}x - 10$, then Line A and Line B are:

- (a) parallel
- (b) perpendicular
- (c) vertical lines
- (d) parallel to the x - axis

5) Using the given coordinates of A , B , C , and D , use the slope to determine whether or not $\overline{AB} \parallel \overline{CD}$.
 $A(1,5)$, $B(3,9)$, $C(2,2)$, $D(4,6)$

6) Using the given coordinates of A , B , C , and D , use the slope to determine whether or not $\overline{AB} \perp \overline{CD}$.
 $A(1,7)$, $B(4,9)$, $C(4,0)$, $D(0,6)$