

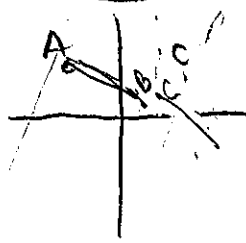
Name Very
8A: Algebra 1

Date _____
Period _____

Homework

1) 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(1,1), C(1,2), D(3,-2)



$A(-1,5) B(1,1)$
 $m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{1 - 5}{1 - (-1)} = \frac{-4}{2} = -2$
 $m = -2$

C(1,2) D(3,-2)

$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-2 - 2}{3 - 1} = \frac{-4}{2} = -2$
 $m = -2$

Yes, they are parallel because the slopes are the same.

2) Using the given coordinates of A, B, C, and D, use the slope to determine whether or not $\overline{AB} \perp \overline{CD}$.

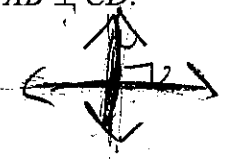
A(1,-5), B(1,3), C(2,6), D(-4,6)

A(1,-5) B(1,3)

$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{3 - (-5)}{1 - 1} = \frac{8}{0}$
 $m = \text{Undefined}$

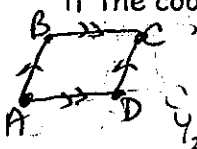
C(2,6) D(-4,6)

$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{6 - 6}{-4 - 2} = \frac{0}{-6} = 0$
 $m = 0$



Yes, they are perpendicular because their slopes are negative reciprocals.

3) A parallelogram is a quadrilateral with two pairs of parallel sides. Show that ABCD is a parallelogram if the coordinates of the vertices are A(-2, 3), B(2,7), C(8,5), and D(4,1).

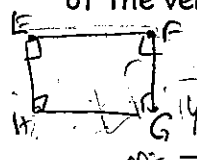


$\overline{AB} \parallel \overline{CD}$
 $A(-2,3) B(2,7)$
 $m = \frac{7-3}{2-(-2)} = \frac{4}{4} = 1$
 $m = 1$
 $C(8,5) D(4,1)$
 $m = \frac{5-1}{8-4} = \frac{4}{4} = 1$
 $m = 1$

$\overline{AD} \parallel \overline{BC}$
 $A(-2,3) D(4,1)$
 $m = \frac{1-3}{4-(-2)} = \frac{-2}{6} = -\frac{1}{3}$
 $m = -\frac{1}{3}$
 $B(2,7) C(8,5)$
 $m = \frac{5-7}{8-2} = \frac{-2}{6} = -\frac{1}{3}$
 $m = -\frac{1}{3}$

Yes! Opposite pairs of sides are parallel so it is a parallelogram.

4) A rectangle is a quadrilateral with four right angles. Show that EFGH is a rectangle if the coordinates of the vertices are E(-3,-5), F(3,-1), G(1,2), and H(-5,-2).

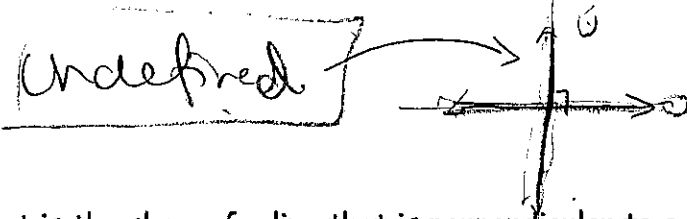


$\overline{EF} \perp \overline{EH}$
 $E(-3,-5) F(3,-1)$
 $m = \frac{-1 - (-5)}{3 - (-3)} = \frac{4}{6} = \frac{2}{3}$
 $m = \frac{2}{3}$
 $E(-3,-5) H(-5,-2)$
 $m = \frac{-2 - (-5)}{-5 - (-3)} = \frac{3}{-2} = -\frac{3}{2}$
 $m = -\frac{3}{2}$

$\overline{GH} \perp \overline{FG}$
 $G(1,2) H(-5,-2)$
 $m = \frac{-2 - 2}{-5 - 1} = \frac{-4}{-6} = \frac{2}{3}$
 $m = \frac{2}{3}$
 $F(3,-1) G(1,2)$
 $m = \frac{2 - (-1)}{1 - 3} = \frac{3}{-2} = -\frac{3}{2}$
 $m = -\frac{3}{2}$

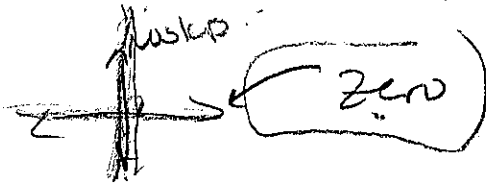
Opposite sides are parallel and adjacent sides are perpendicular. Negative reciprocals.

5) (a) What is the slope of a line that is perpendicular to a line whose slope is 0? Explain your answer.



The line would be vertical
+ vertical lines
have undefined slopes

(b) What is the slope of a line that is perpendicular to a line that has no slope?



Undefined

A horizontal line with a slope of 0

In 6-14: (a) What is the slope of a line that is parallel to each line whose equation is given?

(b) What is the slope of a line that is perpendicular to each line whose equation is given?

→ same slope

→ Neg. reciprocal

6) $y = 2x + 6$

$m = 2$

parallel: 2

perp: $-\frac{1}{2}$

7) $y = x - 2$

$m = 1$

parallel: 1

perp: -1

8) $y = -3x + 7$

$m = -3$

parallel: -3

perp: $\frac{1}{3}$

9) $\frac{3y}{3} = \frac{x}{3}$
 $y = \frac{1}{3}x$

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

parallel: $\frac{1}{3}$

perp: -3

10) $x - y = 4$
 $\frac{-x}{-1} = \frac{-x + 4}{-1}$

$y = x - 4$

$m = 1$

parallel: 1

perp: -1

13) $x = 4$

$m = \text{undefined}$

parallel: undefined

perp: zero

11) $2x - 3y = 6$
 $\frac{-2x}{-3} = \frac{-2x + 6}{-3}$

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

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

parallel: $\frac{2}{3}$

perp: $-\frac{3}{2}$

14) $y = -5$

$m = \text{zero}$

parallel: zero

perp: undefined

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

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

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

parallel: $\frac{1}{2}$

perp: -2

