

## 3.5 Equations of Parallel &amp; Perpendicular Lines DAY TWO CYU

Use when you get it right all by yourself

**S** Use when you did it all by yourself, but made a silly mistake

**H** Use when you could do it alone with a little help from teacher or peer

**G** Use when you completed the problem in a group

**X** Use when a question was attempted but wrong (get help)

**N** Use when a question was not even attempted

CONCEPTS	BASIC	INTERMEDIATE	ADVANCED
Perpendicular slope	1, 4	2, 5	7, 8
Distance formula	1		8
Parallel slope		2	3, 6
Writing Equations			3, 6, 7
Midpoint formula	4		
Slope formula	5		

1. Find the distance from point A to the given line.

a.  $A(-1, 7), y = 3x$

$\approx 3.2u$

c.  $A(15, -21), 5x + 2y = 4$

$\approx 5.4u$

b.  $A(-9, -3), y = x - 6$

$\approx 8.5u$

d.  $A(-\frac{1}{4}, 5), -x + 2y = 14$

$\approx 1.7u$

2. Describe and correct the error in determining whether the lines are parallel, perpendicular, or neither.

**X**

Line 1:  $(3, -5), (2, -1)$

Line 2:  $(0, 3), (1, 7)$

$$m_1 = \frac{-1 - (-5)}{2 - 3} = -4 \quad m_2 = \frac{7 - 3}{1 - 0} = 4$$

Lines 1 and 2 are perpendicular.

product  $\neq -1$   
lines 1 & 2 are neither  
// or  $\perp$

3. Describe and correct the error in writing an equation of the line that passes through the point  $(3, 4)$  and is parallel to the line  $y = 2x + 1$ .

**X**

$$y = 2x + 1, (3, 4)$$

$$4 = m(3) + 1$$

$$1 = m$$

The line  $y = x + 1$  is parallel to the line  $y = 2x + 1$ .

//  $\leftrightarrow$  have same  $m$  & different  $b$ .

$$y = 2x + 1, (3, 4)$$

$$4 = 2(3) + b$$

$$-2 = b$$

not //

4. Find the midpoint of  $\overline{PQ}$ . Then write an equation of the line that passes through the midpoint and is perpendicular to  $\overline{PQ}$ . This line is called the *perpendicular bisector*.

a)  $P(-4, 3)$  &  $Q(4, -1)$

$(0, 1); y = 2x + 1$

b)  $P(-5, -5)$  &  $Q(3, 3)$

$(-1, -1); y = -x - 2$

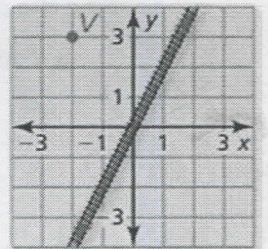
5. A triangle has vertices  $L(0, 6)$ ,  $M(5, 8)$ , and  $N(4, -1)$ . Is the triangle a right triangle? Explain your reasoning.

$m\overline{LM} = \frac{2}{5}$     $m\overline{LN} = -\frac{7}{4}$     $m\overline{MN} = 9$    **NO**

So none are  $\perp$

6. A new road is being constructed parallel to the train tracks through point  $V$ . An equation of the line representing the train tracks is  $y = 2x$ . Find an equation of the line representing the new road.

$y = 2x + 7$

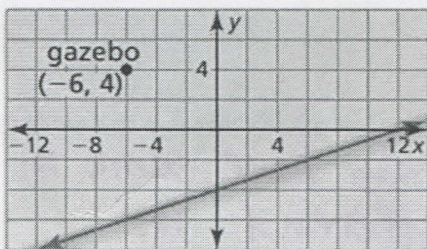


7. A bike path is being constructed perpendicular to Washington Boulevard through point  $P(2, 2)$ . An equation of the line representing Washington Boulevard is  $y = -\frac{2}{3}x$ . Find an equation of the line representing the bike path.

$y = \frac{3}{2}x - 1$



8. A gazebo is being built near a nature trail. An equation of the line representing the nature trail is  $y = \frac{1}{3}x - 4$ . Each unit in the coordinate plane corresponds to 10 feet. Approximately how far is the gazebo from the nature trail?



$\approx 95$  ft

**CYU Reflection:** How far can you go: basic, intermediate, or advanced?

Rate your mastery level!

How confident are you with the skills this CYU covered? Circle the score you would give yourself.

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1	2	3	4	5	6	7	8
Basic		Intermediate			Advanced		Solved ALL!

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