## Concept 8: Parallel & Perpendicular Slopes

### Level 2
1. Watch the video (Parallel & Perpendicular Slopes: Level 2)
2. Complete the Notes & Basic Practice
3. Complete 2 of the following tasks
   - IXL Practice
   - S18 – (Algebra 1) (at least to 85)
   - Worksheets
   - Parallel Slopes Level 2
   - Creating
   - Create a graph using [www.desmos.com](http://www.desmos.com) of 10 parallel lines. Take a screenshot of the graph, upload it to google drive and share it with me.
4. Take the Schoology Quiz (Concept 8: Level 2)
   - Score of 4 or higher move to level 3
   - Score of 3 or less, complete the Level 2 Review

### Level 3
1. Watch the video (Parallel & Perpendicular Slopes: Level 3)
2. Complete the Notes & Basic Practice
3. Complete 2 of the following tasks
   - IXL Practice
   - S19 – (Algebra 1) (at least to 85)
   - Worksheets
   - Parallel & Perpendicular Slopes Level 3
   - Creating
   - Create a graph using [www.desmos.com](http://www.desmos.com) of 4 sets of parallel and perpendicular lines. Share the graph with me using google drive
4. Take the Schoology Quiz (Concept 8 – Level 3)
   - Score of 3 or less, complete the Level 3 Review
   - Score of 4 or higher congratulations, move on to level 4!

### Level 4
1. Watch the video (Parallel & Perpendicular Slopes: Level 4)
2. Complete the Notes & Basic Practice
3. Complete 2 of the following tasks
   - IXL Practice
   - E6 – (Geometry) (at least to 85)
   - Worksheets
   - Parallel & Perpendicular Slopes Level 4
   - Creating
   - Create a graph with a rectangle made from 4 equations
4. Take the Schoology Quiz (Concept 8 – Level 4)
   - Score of 3 or less, complete the Level 2 Review
   - Score of 4 or higher congratulations, you are a Math Master!
Level 2/3:

**Goals:**

I have mastered **level 2** when I can:
- Identify Parallel Slopes from a Graph and Equation
- Create a parallel equation given an equation or graph

I have mastered **level 3** when I can:
- Identify Perpendicular Slopes from a Graph and Equation
- Create a Perpendicular equation given an equation or graph

**Notes:**

<table>
<thead>
<tr>
<th>Big Ideas</th>
<th>Examples/Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Examples of Parallel Equations &amp; Graphs</td>
<td></td>
</tr>
<tr>
<td>Slopes are Parallel when...</td>
<td></td>
</tr>
</tbody>
</table>

| Examples of Perpendicular Equations & Graphs |  |
| Slopes are Perpendicular when... |  |
Level 2 Practice:

Find the slope of a line parallel to each given line.

1) \( y = 2x + 4 \) 
2) \( y = -\frac{2}{3}x + 5 \) 
3) \( y = 4x - 5 \) 
4) \( y = -\frac{10}{3}x - 5 \)

For each graph below, write an equation for a parallel line.

Level 3 Practice:

Find a slope that is perpendicular
Find a slope that is perpendicular to the line that goes through each of the two points below.

For each equation below

\[ y = -\frac{1}{2}x - 1 \]
\[ y = \frac{4}{5}x \]

1) through \((-5, -4)\) and \((0, -5)\) 
2) through \((-2, -1)\) and \((0, -4)\)

For each graph below, write an equation for a perpendicular line.
Worksheet Level 2: Parallel & Perpendicular

Goals:
I have mastered level 2 when I can:
  Identify Parallel Slopes from a Graph and Equation
  Create a parallel equation given an equation or graph

Practice #1

Write an equation for a line that is parallel to the given information.

1) Slope = \( \frac{1}{3} \), y-intercept = 3
2) Slope = \( \frac{1}{3} \), y-intercept = 0
3) Slope = \( -\frac{4}{3} \), y-intercept = 1
4) Slope = \( \frac{3}{4} \), y-intercept = 5

5) 7) through: \((-3, -5)\) and \((3, 2)\)
6) 8) through: \((-3, 1)\) and \((-5, 3)\)

9) through: \((-3, 3)\) and \((0, 3)\)
10) through: \((2, 5)\) and \((-3, -3)\)
Questions

Which line is parallel to line A? Write out the slopes of the two equations.

Which line is parallel to line B? Write out the slopes of the two equations.

Which line is parallel to line C? Write out the slopes of the two equations.

What do you notice about slopes of parallel lines?
Worksheet Level 3: Parallel & Perpendicular

Goals:
I have mastered level 3 when I can:
Identify Perpendicular Slopes from a Graph and Equation
Create a Perpendicular equation given an equation or graph

Practice #1
For each equation below, find the slope and y-intercept.
Then find an equation that is parallel and an equation that is perpendicular.

<table>
<thead>
<tr>
<th>Equation</th>
<th>$y = 4x + 2$</th>
<th>$y = \frac{2}{7}x + 1$</th>
<th>$y = \frac{-1}{2}x + 1$</th>
<th>$y = -9x - 13$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y-intercept</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Slope</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parallel Equation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perpendicular Equation</td>
<td></td>
<td></td>
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</tbody>
</table>

Practice #2
Create an equation for a perpendicular line that passes through the given point on the graph.
Practice #3

Directions: Graph the points and use a ruler to draw the line that passes through them. Use the designated color to draw each line.

<table>
<thead>
<tr>
<th>BLUE:</th>
<th>(0, 2)</th>
<th>(2, -1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PURPLE:</td>
<td>(-3, 6)</td>
<td>(-6, 5)</td>
</tr>
<tr>
<td>ORANGE:</td>
<td>(4, 0)</td>
<td>(6, 5)</td>
</tr>
</tbody>
</table>

Given Lines and Their Points

A: (0, 1)  (-5, 3)
B: (3, 0)  (-6, -6)
C: (-2, 4)  (0, -2)

Questions

Which line is perpendicular to line A? Write out the slopes of the two equations.

Which line is perpendicular to line B? Write out the slopes of the two equations.

Which line is perpendicular to line C? Write out the slopes of the two equations.

What do you notice about slopes of perpendicular lines?
Level 4:

Goals:
I have mastered level 4 when I can:
Create a parallel or perpendicular equation given a slope and a point
Analyze a polygon using slopes

Notes:

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Basic Practice:

Determine if each shape below is a rectangle by checking the slopes of each side. (Remember rectangles have 4 right angles.)

A (-4,0)  B (1,2)  K (-2,3)  L (4,2)
C (3,-3)  D (-2, -5)  N (-3,-2)  M (3,-3)

Write the slope-intercept form of the equation of the line described.

1) through (4, 5), parallel to $y = 2x - 2$
2) through (-2, -5), parallel to $y = 10x + 1$

3) through (-2, -2), perp. to $y = \frac{-1}{3}x + 5$
4) through (4, 0), perp. to $y = 4x - 5$
Worksheet Level 4: Parallel & Perpendicular

Goals:
I have mastered level 4 when I can:
Create a parallel or perpendicular equation given a slope and a point
Analyze a polygon using slopes

Practice #1
Create an equation for a parallel line and a perpendicular line that passes through the given point on the graph.
Practice #2

1. Plot each set of points on the graphs below.
2. Find the slopes of each side.
3. Name each polygon based whether or not the sides are parallel or perpendicular or neither.

<table>
<thead>
<tr>
<th>Slopes of the Four Sides</th>
<th>Shape: ______________________</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. (-5,0), (1,4), (6,3), (-3,-3)</td>
<td><img src="image1" alt="Graph 1" /></td>
</tr>
<tr>
<td>2. (-3,-2), (3,1), (5,-3), (-1,-6)</td>
<td><img src="image2" alt="Graph 2" /></td>
</tr>
<tr>
<td>3. (-3,4), (0,4), (3,0), (3,-4)</td>
<td><img src="image3" alt="Graph 3" /></td>
</tr>
</tbody>
</table>

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<thead>
<tr>
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<th>Shape: ______________________</th>
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<tbody>
<tr>
<td>4. (-1,3), (2,7), (5,-2), (2,-5)</td>
<td><img src="image4" alt="Graph 4" /></td>
</tr>
<tr>
<td>5. (-4,-1), (-2,7), (2,6), (3,3)</td>
<td><img src="image5" alt="Graph 5" /></td>
</tr>
<tr>
<td>6. (0,4), (2,8), (6,-2), (2,-1)</td>
<td><img src="image6" alt="Graph 6" /></td>
</tr>
</tbody>
</table>

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<tr>
<th>Slopes of the Four Sides</th>
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</thead>
<tbody>
<tr>
<td>7. (-6,2), (0,6), (2,8), (6,2)</td>
<td><img src="image7" alt="Graph 7" /></td>
</tr>
<tr>
<td>8. (-3,-3), (-1,5), (1,-3), (3,5)</td>
<td><img src="image8" alt="Graph 8" /></td>
</tr>
<tr>
<td>9. (0,0), (4,0), (0,4), (4,4)</td>
<td><img src="image9" alt="Graph 9" /></td>
</tr>
</tbody>
</table>