Concept Category 3: Coordinate Geometry

Recall & Reproduction (DOK 1)

Write the equation of the line that passes through the point (6,2) and is perpendicular to $y = -\frac{3}{4}x - 5$

Routine (DOK 2)

The vertices of quadrilateral MARY are M(-3,3), A(7,3), R(3,6), and Y(1,6). Determine whether quadrilateral MARY is a trapezoid. If it is a trapezoid, determine whether it is an isosceles trapezoid. SHOW ALL WORK!
<table>
<thead>
<tr>
<th>Points</th>
<th>Meaning</th>
<th>Letter Grade Equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.0</td>
<td>• I can solve level 1, 2 and 3 problems completely (recall, routine, and non-routine).&lt;br&gt;• I can explain my approach and reasoning well enough to teach a peer.</td>
<td>A</td>
</tr>
<tr>
<td>3.0</td>
<td>• I can solve level 1 and 2 problems completely (recall and routine).&lt;br&gt;• I can approach and create a plan for level 3 problems (non-routine) that might work.&lt;br&gt;• I can explain my reasoning process for a level 2 (routine) problem completely.</td>
<td>B</td>
</tr>
<tr>
<td>2.0</td>
<td>• I can solve level 1 and 2 problems completely (recall and routine).&lt;br&gt;• I do not know how to create a plan for level 3 problems yet (non-routine).&lt;br&gt;• I can explain how I approach and solve level 1 &amp; 2 problems.</td>
<td>C</td>
</tr>
<tr>
<td>1.0</td>
<td>• I can solve a level 1 problem completely (recall only).&lt;br&gt;• I do not know how to apply the concepts to solving level 2 and 3 problems yet (routine and non-routine).&lt;br&gt;• I can explain my solution path for the level 1 problem (recall only).</td>
<td>D</td>
</tr>
<tr>
<td>Not Yet</td>
<td>• I really don’t get it yet, but I am trying different things I know.&lt;br&gt;• I am not sure which facts apply to solving the problems.&lt;br&gt;• I cannot remember how to approach any of the problems yet.</td>
<td>F</td>
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</tbody>
</table>
**Concept Category 3: Coordinate Geometry**

**Recall & Reproduction (DOK 1)**

Write the equation of the line that passes through the point (6,2) and is perpendicular to \( y = \frac{3}{4}x - 5 \)

What is mean for a line to pass through a specific point?

What do you know about the relationship between the slopes of two lines that are perpendicular?

What do you know about the relationship between the y-intercepts of two lines that are perpendicular?

**Routine (DOK 2)**

The vertices of quadrilateral MARY are M(-3,3), A(7,3), R(3,6), and Y(1,6). Determine whether quadrilateral MARY is a trapezoid. If it is a trapezoid, determine whether it is an isosceles trapezoid. SHOW ALL WORK!

What makes a shape a trapezoid?

What is the relationship between the slopes of parallel lines?

What makes a trapezoid an isosceles trapezoid?
**Concept Category 3: Coordinate Geometry**

Recall & Reproduction (DOK 1)

Write the equation of the line that passes through the point (6,2) and is perpendicular to \( y = \frac{-3}{4}x - 5 \).

- **Slope of this line**: \( m = \frac{-3}{4} \)
- **Slope of \( \perp \) line**: \( m = \frac{4}{3} \)

Substitute \((6,2)\) into equation

\[
2 = \frac{4}{3} (6) + b \\
2 = 8 + b \\
2 = b
\]

Equation: \( y = \frac{4}{3}x - 6 \)

Routine (DOK 2)

The vertices of quadrilateral MARY are M(-3,3), A(7,3), R(3,6), and Y(1,6). Determine whether quadrilateral MARY is a trapezoid. If it is a trapezoid, determine whether it is an isosceles trapezoid. **SHOW ALL WORK!**

- Trapezoid has 1 pair of \( \parallel \) sides
- Isosceles Trapezoid also has the pair of \( \parallel \) non-parallel sides congruent.

- \( QR \parallel MA \)?
- The slope of \( QR \): \( m = 0 \)
- The slope of \( MA \): \( m = 0 \)
- Since the slopes of \( QR \) and \( MA \) are equal, the sides are \( \parallel \)!
- Hence MARY is a Trapezoid.

- Are the non-parallel sides congruent?
  - i.e., have same length?
  - \( m_y^2 = 4^2 + 3^2 \)
  - \( m_y = \sqrt{16 + 9} = \sqrt{25} = 5 \)
  - \( AR^2 = 3^2 + 4^2 \)
  - \( AR = 5 \)

- Since \( m_y = AR \), Trapezoid MARY is an Isosceles Trapezoid