Geometry **Name:** _____

Notes – 4.1/4.7 Coordinate Proofs **Date:** _____ **Period:** _____

- I can classify triangles on the coordinate plane using slope and distance formulas.

Recall:

Slope formula: $m = \frac{y_2 - y_1}{x_2 - x_1}$ Distance formula: $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

Two lines on the coordinate plane are **perpendicular** if _____.

To classify triangles on the coordinate plane:

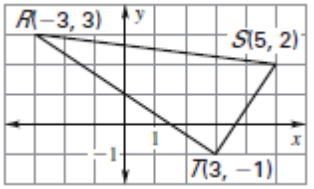
1) Use the distance formula to find the length of each side of the triangle.
   - If no sides are congruent, the triangle is _____.
   - If two sides are congruent, the triangle is _____.
   - If all three sides are congruent, the triangle is _____.

2) Use the slope formula to determine if any sides are perpendicular to determine if the triangle is a right triangle.
   - **IF** the triangle **IS** a right triangle, the right angle will always be opposite the longest side, so…

     _____

Example: Classify ΔRST by its side lengths. Then determine if the triangle is a right triangle.

Step 1: Use distance formula to find the side lengths:



The triangle has _____ *sides, so it is*_____.

Step 2: Use slopes to determine if there is a right angle. The two shortest sides are ____and ____ so find their slopes.

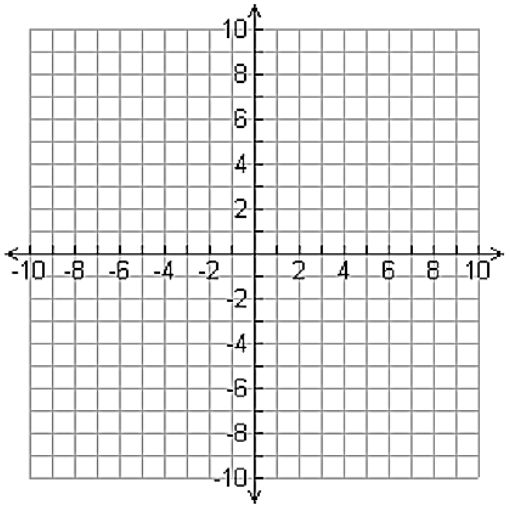
_____and _____ are/are not perpendicular, therefore ∠_____ is/is not a right angle and ΔRST *is/ is not a*_____.

Solution: ΔRST *is* _____

Think you got it? Great! Try a couple on your own ☺

1) The vertices of ΔXYZ are $X(-2,3)$, $Y(-2,-7)$, and $Z(4,-5)$.

Classify ΔXYZ by its side lengths, then determine if the triangle is a right triangle.



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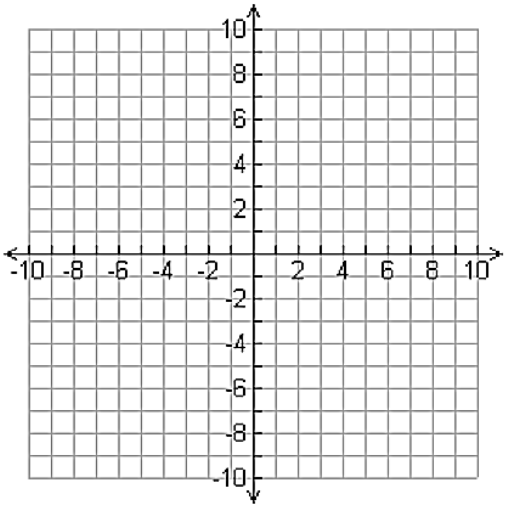
2) The vertices of ΔPQR are $P(-3,-1)$, $Q(-4,4)$, and $R(7,1)$.

Classify ΔXYZ by its side lengths, then determine if the triangle is a right triangle.

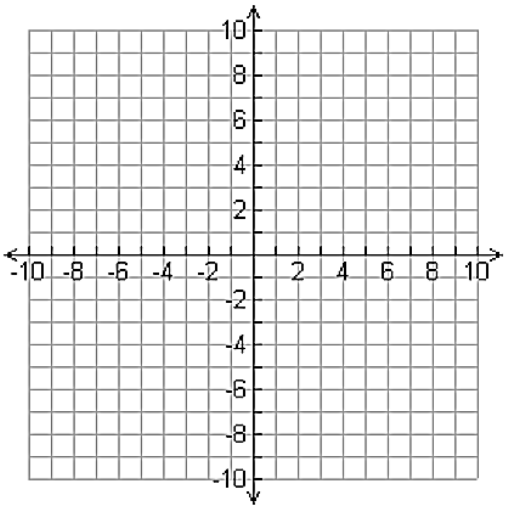


Geometry **Name: _____**

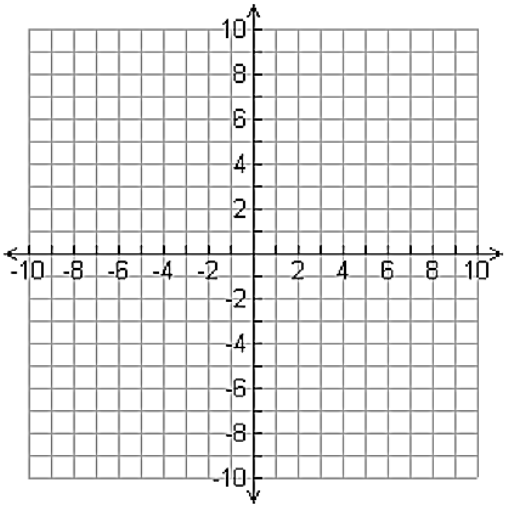
Homework: 4.1/4.7 Coordinate Proofs **Date: _____ Period: _____**

A triangle has the given vertices. Graph the triangle and classify it by its side lengths. Determine if the triangle is a right triangle.

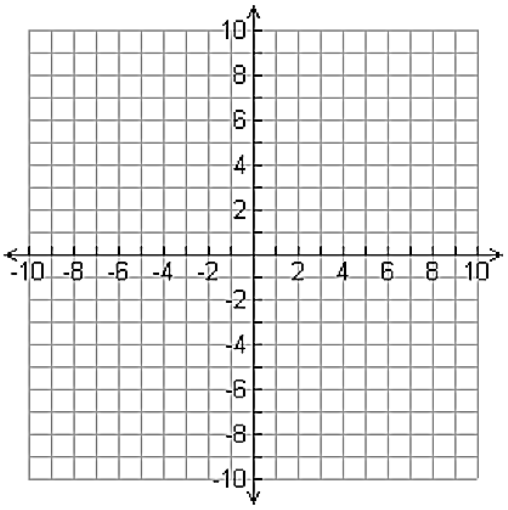
1. A(-3, 3), B(2, 8), C(7, 3)



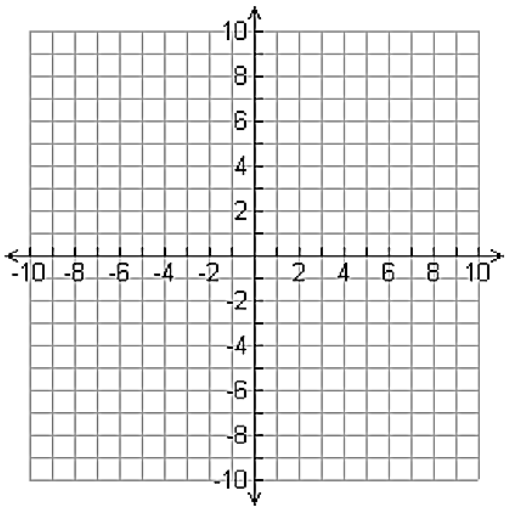
2. D(1, 1), E(4, 0) F(8, 5)



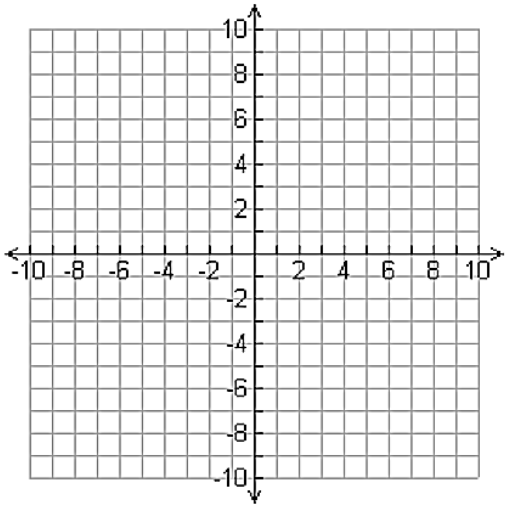
3. G(1, -3), H(2, -6), I(-1, -5)



4. J(0, 0), K(6, 0), L(3, $\sqrt{27}$)



5. M(0, 0), N(1, 3), O(3,1)



Extension Questions…

6. In ΔABC , which angles can you conclude are congruent? Why? What is the measure of $\angle A$?

7. Which triangles can you conclude are congruent? Why?

8. In ΔJKL , what is the measure of $\angle K$?

Answers:

1) Right Isosceles 2) Scalene 3) Isosceles 4) Equilateral 5) Isosceles

6) $\angle A \cong \angle B$; both are 45° 7) $\Delta GHI \cong \Delta MNO$ because all of their corresponding sides are congruent.

8) $m\angle K = 60^\circ$