Name _____ Date _____ Period _____

Topic: Unit 2 Extra / Review **Class Website**: msgiwa1.weebly.com

NEW: Changing Variables

1) You have a box that is increasing. The diagonal of the box is 12. The ratio of the box is 3:5. What are the width and the height of the box?

2) You have a box that is increasing. The diagonal of the box is 39. The ratio of the box is 1:3. What are the width and the height of the box?

3) You have a box that is increasing. The diagonal of the box is 32. The ratio of the box is 2:4. What are the width and the height of the box?

Review (Angle of Elevation and Depression)

4) Two buildings are 15 meters apart. The height of the shorter building is 22 meters. The angle of elevation from the shorter building to the taller building is 40º. What is the height of the taller building?

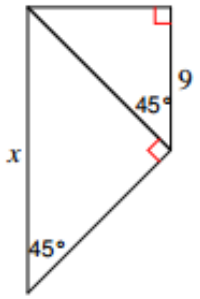
5) You are standing 20 feet away from the base of a tree when you discover there are two kittens stuck at different levels on the tree's branches. You approximate that the angle of elevation to the first kitten is 36º and the angle of elevation to the second kitten is 40º. Your eye level is 6 feet off of the ground. To the nearest foot, what is the distance between both kittens? Justify your answer.

6) A ramp is attached to a loading dock and makes a 22º angle with the ground. If the loading dock is 5 meters high, how long is the ramp? Round your answer to the nearest tenth.

7) A weather station receives an alert from a weather balloon. The balloon is 10 kilometers away and the angle of depression of the balloon to the weather station is 51º. If the balloon travels vertically down to level ground, how far will the balloon be from the weather station?

Special Right Triangles!

8)



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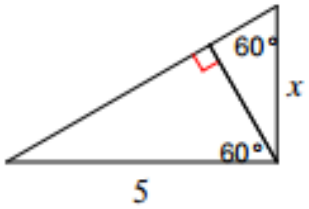


Right Triangles in a Coordinate Plane.

10) The coordinates of the vertices of triangle ABC are A (13, -1), B (-9, 3) and C (-3, -9). What are the measurements of the two acute angles?

11) The coordinates of the vertices of triangle DEF are D (-8, -5), E (6, 1) and F (-4, 5). What are the measurements of the two acute angles?

12) The coordinates of the vertices of triangle GHI are G (-4, 5), H (6, 1) and I (-8, -5). What are the measurements of the two acute angles?

Part 2

1. You are a firefighter on call at a burning building. Your colleagues are on the roof preparing to help put out the blaze by entering the building through the third-floor window. They need you to find the distance from the roof to the windowsill and then determine if the firefighters on the ground are close enough to the building for the water to reach the flames through the window on the third floor.

   You observe from below. The angle of elevation to the windowsill is 18 degrees and the angle of elevation to the top of the building is 31 degrees. You are standing 65 feet away from the building and your eyes are 5 feet above the ground, as shown in the diagram. You hold the hose at eye level in order to take aim at the third-floor window.

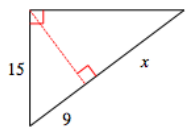
   To the nearest foot, what is the distance from the roof to the windowsill that the firefighters will need to descend by rope to enter the building? If the hoses can spray water at a distance of 100 feet, are the firefighters standing close enough to the building to put the flames out at the third-floor window?

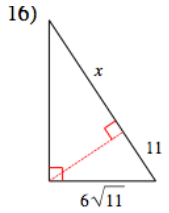
2. You have a box that is increasing. The diagonal of the box is 30. The ratio of the box is 3:2. What is the width and the height of the box?

3. Ms. Giwa is trying to figure out if she has a right triangle. She has the vertices (3, 3), (3, 7) and (9, 3). Figure out first if she has a right triangle (Distance formula + Pythagorean Theorem). If she has one, find the measurements of the two acute angles (Inverse Trig).

4. Ms. Giwa has the following points, (2, 0), (-1, -1) but she doesn't have the x value for the last point (m, 3). She knows the points make a right triangle but she is not sure if she meant to write down 11, 10 or 1 for m. Use the distance formula and the Pythagorean theorem to figure out which number is m.

5. Using the Geometric Mean formula, find every missing side.





6. A plane is flying at an altitude of 12,000 m. From the pilot, the angle of depression to the airport tower is 32°. How far is the tower from 12,000 m a point directly beneath the plane?
7. You have a box that is increasing. The diagonal of the box is 19. The ratio of the box is 5:1. What is the width and the height of the box?
8. What are the measurements of the acute angle for a triangle with the vertices (-1, -2), B (4, -2) and (4, 3)? (Distance formula + Inverse Trig)
9. Ms. Giwa gives you the following coordinate points, what is the missing variable that will make a right triangle? (5, -3), (2, -6) and (a, 1). Is a equal to 3, 4, 5 or 1? (Use the distance formula to find each side length then use the Pythagorean theorem to check if each a makes a right triangle.)