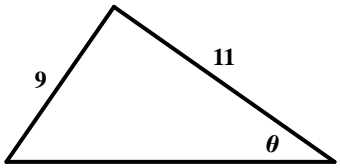
Algebra 2/Pre-Calculus **Name**_____

Right Triangle Trig Review

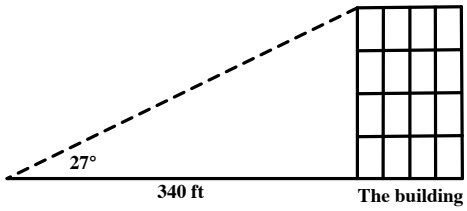
Carefully complete each of the following problems. Show all work. You may use a calculator, except where the directions say otherwise.

1. Find the values of $\cos\theta$, $\sin\theta$, $\tan\theta$, $\sec\theta$, $\csc\theta$, and $\cot\theta$ in the right triangle pictured below. Give exact answers, not decimal approximations.



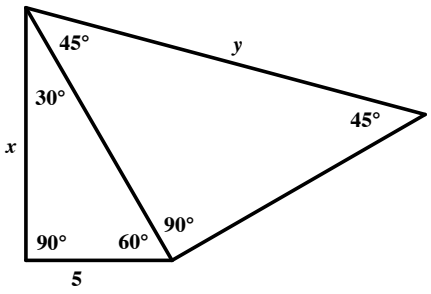
Answer a. $\cos\theta = \frac{11}{\sqrt{202}}$, $\sin\theta = \frac{9}{\sqrt{202}}$, $\tan\theta = \frac{9}{11}$, $\sec\theta = \frac{\sqrt{202}}{11}$, $\csc\theta = \frac{\sqrt{202}}{9}$, $\cot\theta = \frac{11}{9}$

2. Olivia was trying to find the height of a tall building. She stood 340 feet from its base and found that the angle formed by the ground and the top of the building was 27° (as pictured below). What was the height of the building? (Round your answer to two decimal places.)



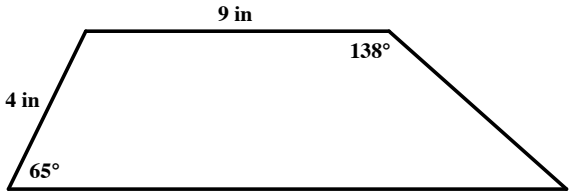
Answer 173.24 feet

3. Find the values of x and y in the diagram below. Give exact answers, not decimal approximations.



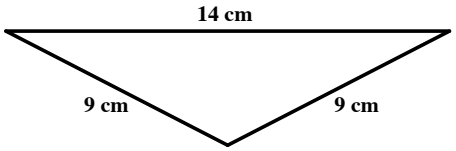
Answers $x = 5\sqrt{3}$ and $y = 10\sqrt{2}$

4. Find the area and the perimeter of the trapezoid pictured below.



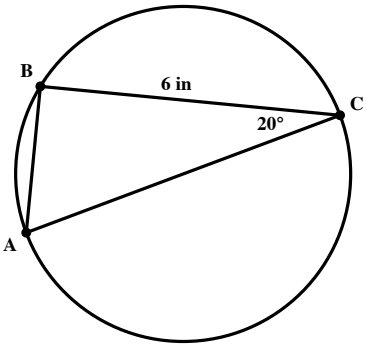
Answers Area = 42.99 square inches. Perimeter = 33.13 inches.

5. Find the area of the triangle pictured below. Then find the measurements for all of the angles in this triangle.



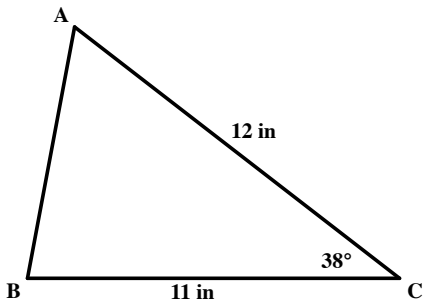
Answers Area = $\frac{1}{2}(14)(\sqrt{32}) = 39.60$. Angles: 38.94°, 38.94°, 102.12°.

6. Suppose AC is a diameter. If a point in the circle is chosen at random, what is the probability that the point will also be inside the triangle?



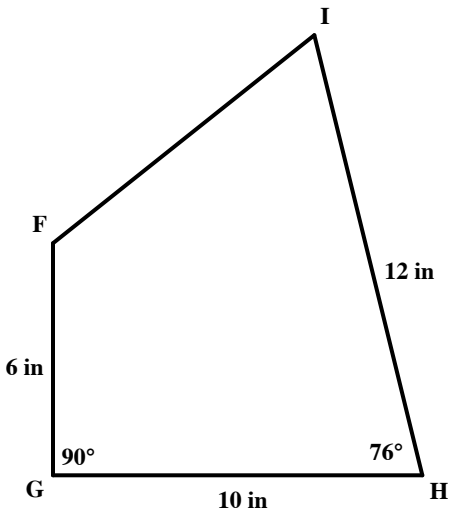
Answer Probability = 0.205 (Area of triangle = 6.551, Area of circle = 32.019, so probability = $\frac{6.551}{32.019} = 0.205$)

7. Find the area of the triangle pictured below. Then find the measures of all missing sides and angles.



Answers Area = 40.63, $\angle B = 78.20^\circ$, $\angle A = 63.804^\circ$, $AB = 7.55$

8. Find the area of the quadrilateral below



Answers 79.5 square inches.

9. Explain why the sides of a 45-45-90 triangle are always in a ratio of 1, 1, and $\sqrt{2}$. Make your explanation as clear as possible. ***Suggestion:*** Same as the last problem. ***Note:*** A hinted version of this question was asked in a previous problem set, so you can look up the solution, if necessary.

10. Explain why the sides of a 30-60-90 triangle are always in a ratio of 1, $\sqrt{3}$ and 2. Make your explanation as clear as possible. ***Suggestion:*** Same as the last problem. ***Note:*** A hinted version of this question was asked in a previous problem set, so you can look up the solution, if necessary.

11. Optional Bonus Problem Emily was trying to find the height of a building. She found the angle formed by the ground and the top of the building was 59°. Then she walked back 100 feet and found that the angle formed by the ground and the top of the building was 41°. (See the diagram below, which is not drawn to scale.) What was the height of the building? ***Hint:*** There are two right triangles. Start by setting up a system of equations. (Two equations and two variables.) Then solve.