Exam II

Practice Problems

EXACT TRIG FUNCTION VALUES

You should have the exact values of $\sin\theta$ and $\cos\theta$ for $\theta = 0°, 30°, 45°, 60°$, and $90°$ memorized. You are not allowed to use a calculator for these questions, unless you are just adding two numbers together. You should be able to write out how to find these values by only using $\sin\theta$ and $\cos\theta$ for θ listed above.

1. Find the exact value for $\cot(45°)$.

2. Find the exact value for $\tan(-405°)$.

3. Find the exact value for $\sec(870°)$.

Increasing or Decreasing

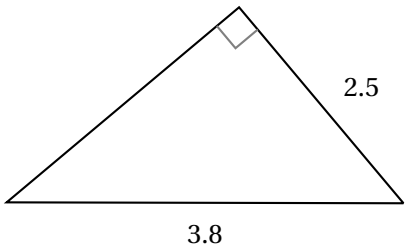
You should be able to determine if each of the six trigonometric functions are increasing or decreasing for angles in the first quadrant. Remember, it will benefit you to remember the *complementary identities* relating sin and cos to complementary angles, etc. I find it helpful to draw a sketch.

4. Determine the relation of the following trigonometric values.

$\sin 40^\circ$		$\cos 35^\circ$	$\sec 20^\circ$		$\csc 60^\circ$	$\tan 375^\circ$		$\cot -340^\circ$

Completing Triangles

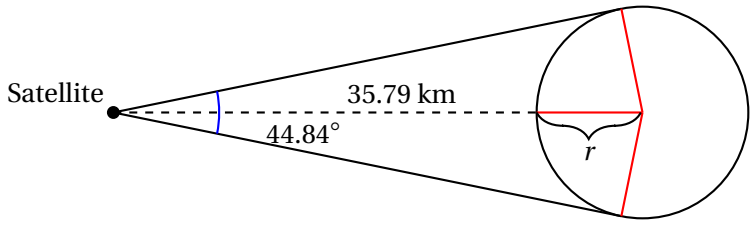
5. Find all the missing sides and angles from the given triangle. This problem doesn't adhere to the significant figures principal. Your side lengths should be exact, and your angles should be rounded to a tenth of a degree, ie: 46.7°.



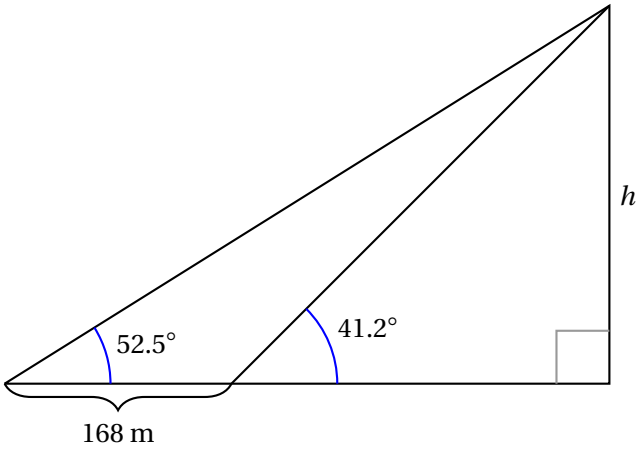
APPLICATIONS

These problems *do* adhere to the significant figures principal, and your answers should too.

3. A satellite is in geosynchronous orbit around the earth, measured at 35.79 km above the earth's surface. The satellite measures the angle between the horizons of the earth to be $\theta = 44.84°$. Use this to estimate the radius of the Earth. It might help to recall that lines tangent to a circle are perpendicular to the the radius.

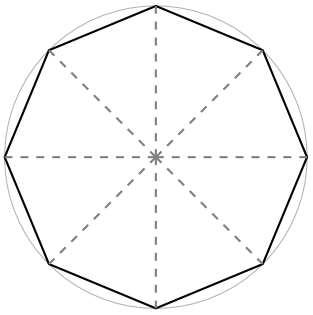


4. Find h as indicated in the figure.



5. Find the are of a regular polygon inscribed in a circle of radius 2.0cm with eight sides (drawn to scale!). It will help to recall that the area of a triangle is given by base times height.

Regular Polygon



You will be given a problem similar to one of the Section 2.5 worksheet without a drawing. Be sure to know what is meant when someone says any of the following: angle of elevation, angle of depression, bearing.

6. An statue is placed top of large boulder. I want to know the height of the statue. I walk 28.0 meters from the boulder and measure the angle of elevation from the top of the statue and the angle of elevation to the bottom of the statue. The angle of elevation to the top of the statue is $27°10'$, and the angle of elevation to the bottom of the antenna is $18°10'$. Find the height of the statue. Include a sketch to document your work.