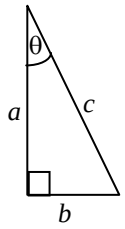
Patterning - Winter
Quiz 7

Name:_____

For each question, your solution must show work/calculations and display/explain your reasoning.



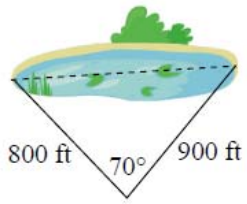
$$a^2 + b^2 = c^2$$

$$\sin\theta = \frac{b}{c} \qquad \cos\theta = \frac{a}{c} \qquad \tan\theta = \frac{b}{a}$$

1. Converting between Cartesian and polar coordinates.
a) Convert the Cartesian coordinate (–4, –3) to polar coordinates, $0 \leq \theta < 2\pi$.

b) Convert the polar coordinate $(2, 5\pi/6)$ to Cartesian coordinates.

2. To find the distance across a small lake, a surveyor has taken the measurements shown. Note that the figure is not drawn to scale. Determine the distance across the lake.



3. To estimate the height of a building h, two students find the angle of elevation from a point (at ground level) down the street from the building to the top of the building is 39°. From a point that is 300 feet closer to the building, the angle of elevation (at ground level) to the top of the building is 50°. Assume that the street is level. Use this information to estimate the height of the building h using the following steps.

a) Draw a diagram showing this situation. The diagram should include given distances and angles. The diagram should include symbols for unknown quantities required to answer the question.

b) Use some combination of the Pythagorean Theorem and the trigonometric definitions for sin, cos, and tan to write down sufficient equations that could be solved to determine h.

c) Do the algebra to determine h.