Got the HOTS (Higher Order Thinking Skills) for Trig   Name _____
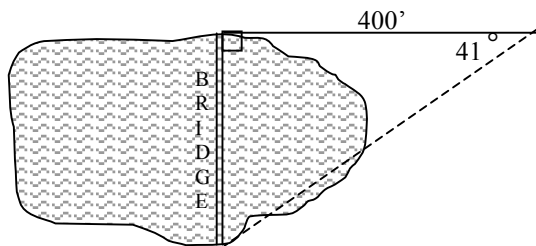
1. You want to build a bridge across a lake but can't walk across the lake
   and measure it directly. So you measure the following distances and
   angles. How long will the bridge be (to the nearest foot)?

2. There is a pole with a guy wire attached to the top and anchored at a sixty degree angle with the
   ground ten feet from the pole (as shown below left). Then another wire is anchored to form a 45°
   angle and a third to form a 30° angle. How far from the pole are each of the other two wires
   anchored?

$d_1 =$ _____'

$d_2 =$ _____'
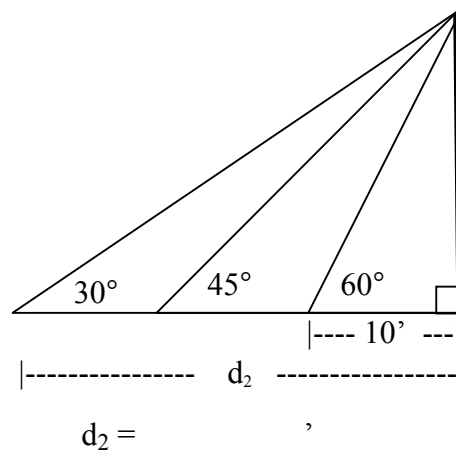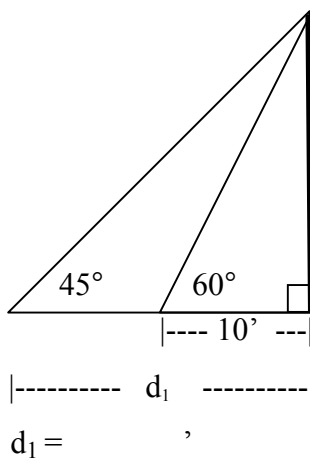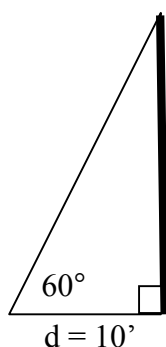
3. Angle A has a larger tangent ratio than angle B. Which angle is larger? Justify your answer by any
   means other than citing instances from your calculator.

4. Suppose the owner of the factory needs to install a new ramp for the loading dock. The ramp makes
   a 5° angle with the ground. How far will this ramp extend from the loading dock? Explain.

5. The hypotenuse of a right triangle measures 9 inches, and one of the acute angles measures 36°.
   What is the area of the triangle? (Round to the nearest square inch.)

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6. Duffy thinks that since sine involves the *opposite* side, and cosine involves the *adjacent* side, and that tangent is defined as the ratio of *opposite* to the *adjacent* side, that the tangent of an angle will equal the sine divided by the cosine of the angle. Mathematically support or refute his claim below.
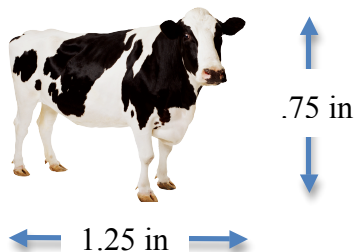
$$\tan A = \frac{\sin A}{\cos A}$$

7. Given the three points B(-2, -4), C(3, 3), D(-2, 3), find all three angle measures of ΔBCD.
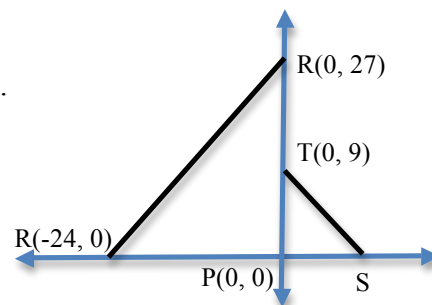
8. a) Show that the slope of the line below is equivalent to the tangent of the angle formed with the x-axis.

    b) Is this true for all lines?
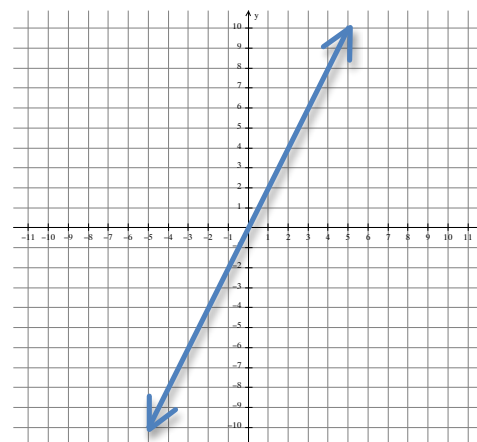
9. The dimensions of the following picture are given. If the true cow is 84" long, how tall is it?

.75 in

1.25 in

10. Given that ΔPQR ~ ΔPST, find the scale factor and the coordinates of S.

R(0, 27)

T(0, 9)

R(-24, 0)

P(0, 0)

S

11. Find the lengths of the legs in the triangle below (rounded to the nearest whole unit). Use the Pythagorean theorem to confirm your answer.

5 cm

37°