College Bound Math Problem Set #6
for the week of November 10, 2014

These problems are related to each other and to set #3.

1. Remembering that *square* and *square root* undo each other, find

(a) $14 \times 14 =$ _____ (c) $15 \times 15 =$ _____ (e) $1.5 \times 1.5 =$ _____

(b) $\sqrt{196} =$ _____ (d) $\sqrt{225} =$ _____ (f) $\sqrt{2.25} =$ _____

2. The goal of this problem is to find the value of $\sqrt{2}$, correct to one decimal place.

(a) Show that $\sqrt{2} = \frac{1}{10}\sqrt{200}$.

(b) Use the results of problem #1 to explain why $\sqrt{200}$ must be between 14 and 15.

(c) Why do you think $\sqrt{200}$ is ***closer to 14*** than it is to 15.

(d) Can you see that, taken together, the results of parts (a) and (c) show that 1.4 is the best one-decimal-place approximation to $\sqrt{2}$?

3. Now you can use your approximation $\sqrt{2} \approx 1.4$ from problem #2 along with Pythagoras' Theorem to draw the graph of a circle of radius 2. This will look a lot like the result in problem #3 in set #3.

(a) Draw *x*-*y* coordinate axes. Make them straight and perpendicular.

(b) Plot the points (2,0), (0,2), (-2,0), and (0,-2).

(c) Plot the point $\left(\sqrt{2},\sqrt{2}\right)$ using the approximation, $\sqrt{2} \approx 1.4$.

(d) Plot the three other points found from the point in (c) by making one or both of the coordinates in (c) negative.

(e) Use the Pythagorean theorem to show that 2 is the distance from the origin to the point $\left(\sqrt{2},\sqrt{2}\right)$.