Name _____ Block _____

Applications: When would I ever use square roots?

1.) Knowing how to find square roots can help you find the dimensions of a square space.

Peacan trees are planted in square patterns to take advantage of land space and for ease of harvesting. If you wanted to plant 289 trees, how many rows and how many trees would you plant in each row?

2.) Knowing how to estimate square roots can help you approximate how far you can see to the horizon.

a.) The distance you can see to the horizon can be estimated by using the formula $d = 1.22 \times \sqrt{h}$. In the formula, d represents the distance you can see, in miles, and h represents the height your eyes are from the ground, in feet. If you are standing on the ground and your eyes are about 5 feet above ground level, how far can you see?

b.) Suppose you are visiting Washington DC and you climb to the top of the Washington Monument. Your eyes are approximately 520 feet above the ground. Using the formula $d = 1.22 \times \sqrt{h}$, about how far can you see?

4.) Knowing how to estimate square roots can help solve car accident questions.

Police officers can estimate how fast a car was going by measuring the length of the skid marks.

The formula $s = \sqrt{30\,df}$

gives the minimum speed "s" of the car in miles per hour, when "d" is the distance in feet the car skidded after its brakes were applied and "f" is a drag factor that depends on the road surface. Some typical drag factors are listed below.

road surface	drag factor
dry concrete	0.82
packed gravel	0.66
wet concrete	0.57

a.) A car left skid marks for 60 feet on a dry, concrete road surface. If the speed limit on the road were 35 mph, was the car speeding when the brakes were applied? If so, by how much?

b.) Make up your own car skidding/road condition question and solve it. Then pass your question to another group and have them solve it.