Math 2
Unit 3 Day 4 Notes – Radical Applications

Name: Key
Date:

APPLICATION 1: Helen drops a ball from 25 feet above a lake. The formula $t = \frac{1}{4}\sqrt{25 - h}$ describes the t time in seconds that the ball is h feet above the water.

A) How long is the ball in the air when the ball is at 16 feet?

t ↳ h

$t = \left(\frac{1}{4}\right)\sqrt{25 - 16}$

$t = .75$ sec.

B) How many feet above the water will the ball be after 1 second?

h ↳ t

$4(1) = \left(\frac{1}{4}\right)\sqrt{25 - h}$

$(4)^2 = \left(\sqrt{25 - h}\right)^2$

$16 = 25 - h$

$-25 \quad -25$

$-9 = -h$

$\frac{-9}{-1} = \frac{-h}{-1}$

$h = 9$ ft

APPLICATION 2: A formula used to determine the velocity v, in feet per second of an object after it has fallen a certain distance is: $\mathbf{v = \sqrt{2gd}}$ where **g** is the acceleration due to gravity and **d** is the distance the object has fallen. On Earth, the acceleration **(g)** due to gravity is approximately 32 feet per second.

A) If you were to jump off a 15 foot diving board, how fast would you be falling as you entered the water?

↳ d $\quad v = \sqrt{2(32)(15)}$ $\quad$ v

$v \approx 31$ ft / sec.

B) An object is dropped from an upper story window and passes a lower window with a speed radar gun. It clocks in at 90 feet per second. What must the distance be between the upper and lower window (how far had it fallen)?

v

d $\quad 90 = \sqrt{2(32)d}$

$(90)^2 = \left(\sqrt{64d}\right)^2$

$\frac{8100}{64} = \frac{64d}{64}$

$d \approx 127$ ft.

C) A loaf of French bread is dropped from the highest standing deck of the Eiffel Tower (896 feet up). What will the speed of the bread be when it hits the ground?

↳ d $\quad$ ↳ v

$v = \sqrt{2(32)(896)}$

$v \approx 239$ ft / sec.

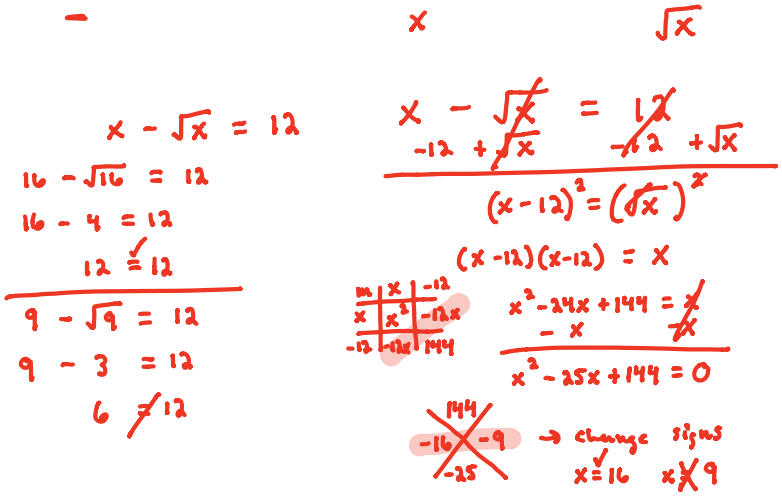
APPLICATION 3: The Ohio State Buckeyes have a new field painter named Payton. He has a fresh bucket of scarlet paint that says it will cover an area of 500 square feet.

He knows that the area of a circle is $A = \pi r^2$

There is a backup painter on the sidelines waiting to take his job so he thinks "Go big or go home." He stakes a rope in the center of the field and measures where to attach the black paint sprayer. What radius should he make the circle of their logo to use up all the white paint?

Applications Cont.:

4. The difference between an integer and its square root is 12. What is the integer?



5. The sum of an integer and twice its square root is 24. What is the integer?