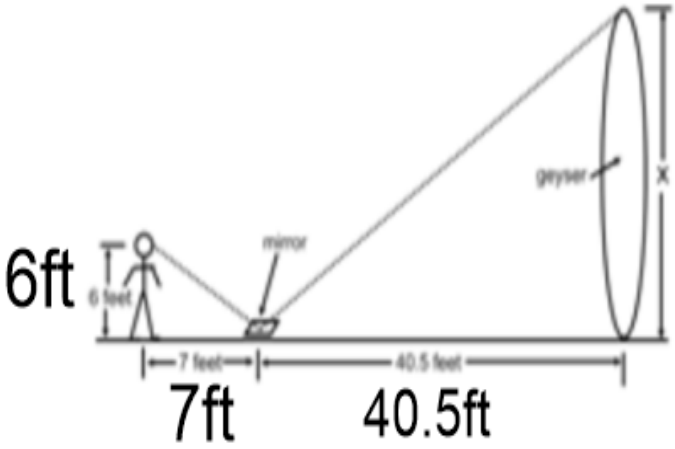
1. Michael places a mirror on the ground 40.5 feet from the base of a geyser. He walks backward until he can see the top of the geyser in the middle of the mirror. At that point, Michael's eyes are 6 feet above the ground and he is 7 feet from image in the mirror. Use similar triangles to find the height of the geyser.

$\frac{6}{7} = \frac{x}{40.5}$

$7x = 6(40.5)$

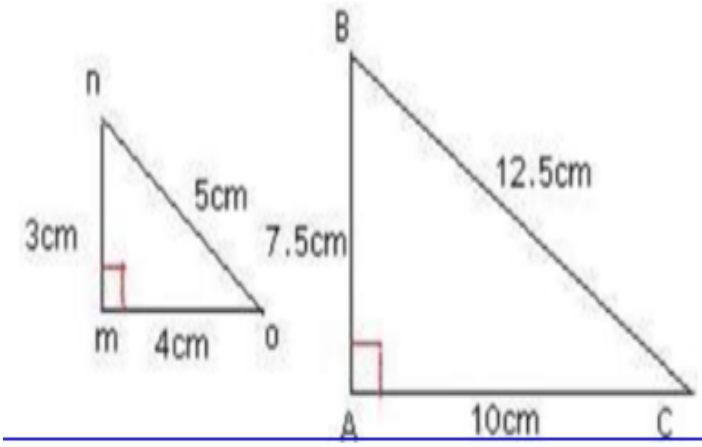
$\frac{7x}{7} = \frac{243}{7}$

$x = 34.7$ ft



2. Determine whether the polygons are similar. If so, write a similarity statement and give the scale factor. If not, explain.

n m o ~ B A C



1 : 0.4

$\frac{3}{7.5} = 0.4$

$\frac{4}{10} = 0.4$

$\frac{5}{12.5} = 0.4$

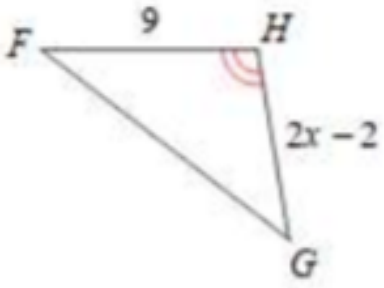
2 + 5

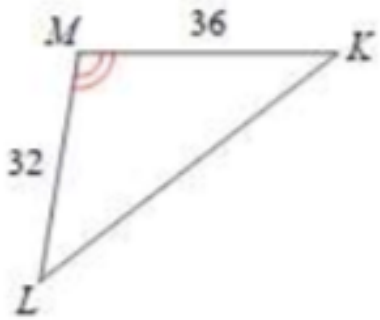
2 : 5

$\frac{2}{5}$

3. Solve for x. The triangles in each pair are similar.

$\triangle MLK \sim \triangle HGF$





$\frac{9}{36} = \frac{2x-2}{32}$

$9(32) = 36(2x-2)$

$288 = 72x - 72$

$+72 \quad +72$

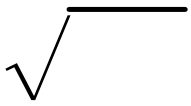
$\frac{360}{72} = \frac{72x}{72}$ $x = 5$

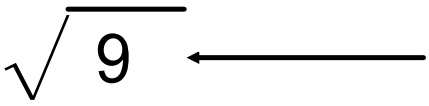
Learning Goal: Today I will learn how to simplify radicals.

Success Criteria: I am able to break a number into its factors and simplify a radical.

Simplifying Radicals

Simplifying Radicals

 = Radical Symbol



Square Root of a Number:

A number that when multiplied by itself equals the radicand.
Example: $3^2 = 9$ and $(-3)^2 = 9$, so 3 and -3 are BOTH square roots of 9

THE PERFECT SQUARE LIST....KNOW IT!

$1^2 = 1$	$\sqrt{1} = 1$
$2^2 = 4$	$\sqrt{4} = 2$
$3^2 = 9$	$\sqrt{9} = 3$
$4^2 = 16$	$\sqrt{16} = 4$
$5^2 = 25$	$\sqrt{25} = 5$
$6^2 = 36$	$\sqrt{36} = 6$
$7^2 = 49$	$\sqrt{49} = 7$
$8^2 = 64$	$\sqrt{64} = 8$
$9^2 = 81$	$\sqrt{81} = 9$
$10^2 = 100$	$\sqrt{100} = 10$
$11^2 = 121$	$\sqrt{121} = 11$
$12^2 = 144$	$\sqrt{144} = 12$
$13^2 = 169$	$\sqrt{169} = 13$
$14^2 = 196$	$\sqrt{196} = 14$
$15^2 = 225$	$\sqrt{225} = 15$

Simplifying Radicals

RULES

1) No perfect squares other than 1 are in the radicand

2) No fractions are in the radicand

3) No radicals in the denominator

Steps to Simplifying Radicals:

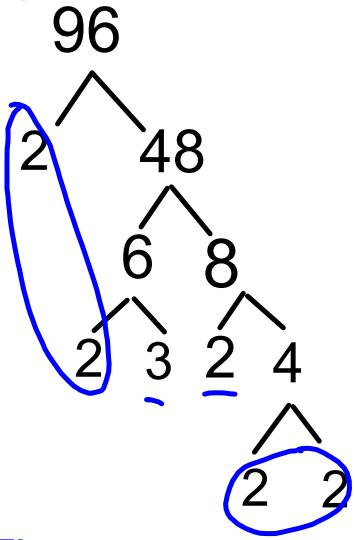
$$\sqrt[2]{96}$$

Step 1: Using a tree or pyramid, find all the prime factors of the radicand. (Prime Factorization)

What 2 numbers do you multiply together to get 96?

If you can't think of one and it ends in an even number, use 2

$4\sqrt{6}$



Step 2: Bring the pairs out (2 become 1). These are your repeaters. Only use the broken down numbers!

We have 5 2's so 4 of them will be repeater. Multiply them together. You do not have another 3, so it stays under the radical like the 2 that does not have a partner.
2 2 2 2 2 3

Step 3: All values inside and outside are multiplied.

$$4\sqrt{6}$$

What if the number is really large?

$$\sqrt{945}$$

945

5 189

3 63

3 21

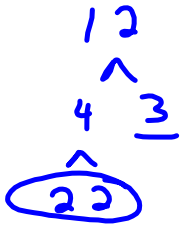
7

$3\sqrt{5 \cdot 7 \cdot 3}$

$3\sqrt{105}$

Simplify

$\sqrt{12}$



$2\sqrt{3}$

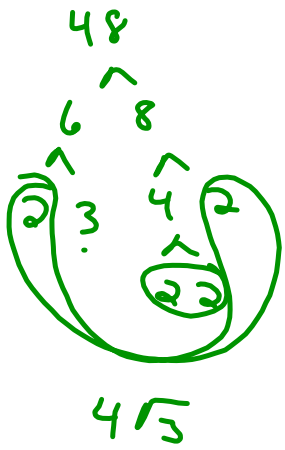
$\sqrt{8}$

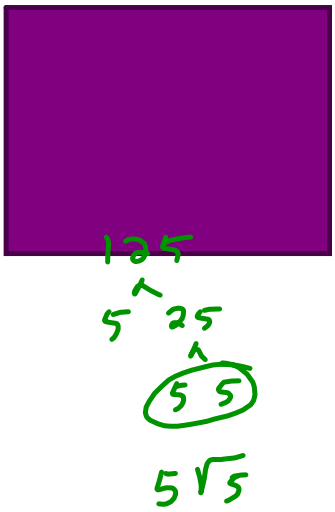
$2\sqrt{2}$

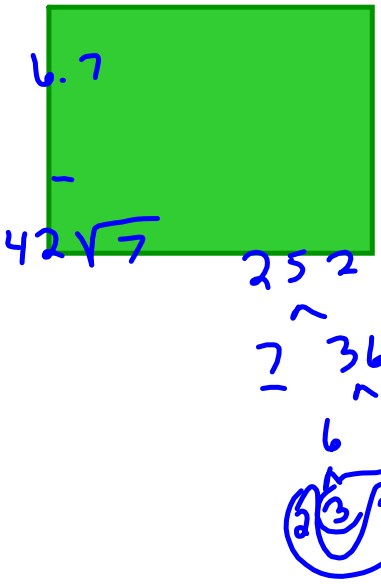
$\sqrt{16} = 4$

Practice

$\sqrt{48}$







If there is a number on the outside, you need to multiply by any number that you put on the outside!

$3\sqrt{8}$

$6\sqrt{2}$

8
4 2
2 2

$5\sqrt{12}$

$10\sqrt{3}$

12
4 3
2 2

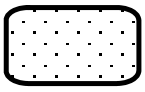
Closure: Today I learned how to simplify a radical.

Remember that 2 become 1.

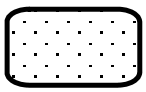
Practice

Simplify.

1) $\sqrt{252}$



2) $\sqrt{192}$



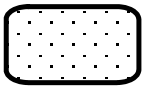
3) $\sqrt{100}$

10

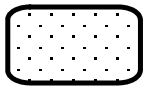
4) $\sqrt{32}$

$4\sqrt{2}$

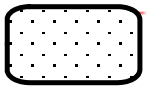
5) $\sqrt{180}$



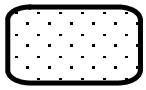
6) $\sqrt{54}$



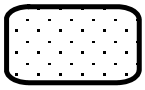
7) $-6\sqrt{128}$



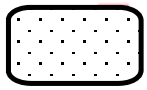
8) $3\sqrt{36}$



9) $6\sqrt{18}$



10) $4\sqrt{50}$



11) $8\sqrt{12}$

12) $-5\sqrt{175}$

13) $\sqrt{45x}$

14) $\sqrt{288k^2}$

15) $\sqrt{63x^4}$

16) $\sqrt{128n^4}$