

## Rationalize the denominator and Simplify radicals

Name \_\_\_\_\_

[HSN-RN.A.2]

**Reasoning:** a radical number is an infinite number; since you can't divide something to infinite, we like to have a finite number as a denominator, the process of eliminating an infinite number as a denominator is called: **rationalizing**

Issue:  $\frac{5}{\sqrt{3}} = \frac{5}{1.73\dots}$

Solution:  $\frac{5}{\sqrt{3}} = \frac{5}{\sqrt{3}} * \frac{\sqrt{3}}{\sqrt{3}} = \frac{5\sqrt{3}}{\sqrt{3} * \sqrt{3}} = \frac{5\sqrt{3}}{3}$

You do:

1.  $\frac{5\sqrt{7}}{\sqrt{3}} = \frac{5\sqrt{7}}{\sqrt{3}} * \frac{\sqrt{\square}}{\sqrt{\square}} = \frac{5\sqrt{\square}}{\square}$

2.  $\frac{8\sqrt{5}}{\sqrt{2}} = \frac{8\sqrt{5}}{\sqrt{2}} * \frac{\sqrt{\square}}{\sqrt{\square}} = \frac{8\sqrt{\square}}{\square}$

3.  $\frac{4\sqrt{8}}{\sqrt{5}} = \frac{4\sqrt{8}}{\sqrt{5}} * \frac{\sqrt{\square}}{\sqrt{\square}} = \frac{4\sqrt{\square}}{\square}$

4.  $\frac{6\sqrt{6}}{\sqrt{7}} = \frac{6\sqrt{6}}{\sqrt{7}} * \frac{\sqrt{\square}}{\sqrt{\square}} = \frac{6\sqrt{\square}}{\square}$

$\sqrt{1} = 1$	$\sqrt{6} = 2.449\dots$
$\sqrt{2} = 1.414\dots$	$\sqrt{7} = 2.646\dots$
$\sqrt{3} = 1.732\dots$	$\sqrt{8} = 2.828\dots$
$\sqrt{4} = 2$	$\sqrt{9} = 3$
$\sqrt{5} = 2.236\dots$	$\sqrt{10} = 3.162\dots$

### Simplify radicals:

Issue: (not a prime number)  $\sqrt{45}$

Solution:  $\sqrt{45} = \sqrt{9 * 5} =$

$\sqrt{9} * \sqrt{5} = 3 * \sqrt{5} = 3\sqrt{5}$

5.  $\sqrt{18} = \sqrt{\square * \square} =$   
 $= \sqrt{\square} * \sqrt{\square} = \square * \sqrt{\square} =$   
 $\sqrt{\square}$

6.  $\sqrt{75} = \sqrt{\square * \square} =$   
 $= \sqrt{\square} * \sqrt{\square} = \square * \sqrt{\square} =$   
 $\sqrt{\square}$

7.  $\sqrt{20} = \sqrt{\square * \square} =$   
 $= \sqrt{\square} * \sqrt{\square} = \square * \sqrt{\square} =$   
 $\sqrt{\square}$