Algebra 1 Name_____ ID: 1

Rationalizing Radicals Practice Date_____ Period____

**Simplify.**

1) $\frac{\sqrt{3}}{2\sqrt{5}} \cdot \frac{2\sqrt{5}}{2\sqrt{5}} = \frac{2\sqrt{15}}{4\sqrt{25}} = \frac{2\sqrt{15}}{20} = \frac{\sqrt{15}}{10}$

2) $\frac{3\sqrt{4}}{2\sqrt{6}}$

3) $\frac{\sqrt{4}}{4\sqrt{5}} \cdot \frac{4\sqrt{5}}{4\sqrt{5}} = \frac{4\sqrt{20}}{16\sqrt{25}} = \frac{8\sqrt{5}}{80} = \frac{\sqrt{5}}{10}$

4) $\frac{\sqrt{2}}{\sqrt{3}}$

5) $\frac{3}{5\sqrt{2}} \cdot \frac{5\sqrt{2}}{5\sqrt{2}} = \frac{15\sqrt{2}}{25\sqrt{4}} = \frac{15\sqrt{2}}{50} = \frac{3\sqrt{2}}{10}$

6) $\frac{3\sqrt{3}}{\sqrt{5}}$

7) $\frac{3}{\sqrt{3}}$

8) $\frac{5}{5\sqrt{3}}$



# Rationalizing the Denominator

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**A. What It Means to Rationalize the Denominator**

In order that all of us doing math can compare answers, we agree upon a common conversation, or set of rules, concerning the form of the answers.

For instance, we could easily agree that we would not leave an answer in the form of 3 + 4, but would write 7 instead.

When the topic switches to that of radicals, those doing math have agreed that a RADICAL IN SIMPLE FORM will not (among other things) have a radical in the denominator of a fraction. We will all change the form so there is no radical in the denominator.

Now a radical in the denominator will not be something as simple as $\sqrt{4}$. Instead, it will have a radicand which will not come out from under the radical sign like $\sqrt{3}$.

Since $\sqrt{3}$ is an irrational number, and we need to make it NOT irrational, the process of changing its form so it is no longer irrational is called RATIONALIZING THE DENOMINATOR.

**B. There are 3 Cases of Rationalizing the Denominator**

1. **Case I:** There is ONE TERM in the denominator and it is a SQUARE ROOT.

*Example:* $\frac{7}{\sqrt{3}}$ — square root; one term

*Procedure:* Multiply top and bottom by the same radical. found on the bottom

$$\frac{7}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{7\sqrt{3}}{3}$$

Look at what is happening here! $(\sqrt{3})^2$
Since squaring is the opposite of taking the square root, they cancel each other, leaving the 3.

$\frac{7\sqrt{3}}{\sqrt{9}} = \frac{7\sqrt{3}}{3}$