

Algebra: Rationalizing Radicals

Practice Worksheet • numberbender.com



Name: _____

Date: _____

Score: ____ / 10

DIRECTIONS

Rationalize the denominator. Multiply by an appropriate form of 1 (radical/radical or conjugate/conjugate). Simplify completely.

<p>1. Rationalize the denominator:</p> $\frac{1}{\sqrt{3}}$ <p>Answer: _____</p>	<p>2. Rationalize the denominator:</p> $\frac{5}{\sqrt{7}}$ <p>Answer: _____</p>
<p>3. Rationalize the denominator:</p> $\frac{8}{\sqrt{2}}$ <p>Answer: _____</p>	<p>4. Rationalize the denominator:</p> $\frac{4}{\sqrt{5}}$ <p>Answer: _____</p>
<p>5. Rationalize the denominator:</p> $\frac{2 + \sqrt{3}}{\sqrt{3}}$ <p>Answer: _____</p>	<p>6. Rationalize the denominator:</p> $\frac{6}{\sqrt{12}}$ <p>Answer: _____</p>
<p>7. Rationalize using the conjugate:</p> $\frac{3}{\sqrt{5} - 2}$ <p>Answer: _____</p>	<p>8. Rationalize using the conjugate:</p> $\frac{6}{\sqrt{3} + 1}$ <p>Answer: _____</p>
<p>9. Rationalize using the conjugate:</p> $\frac{\sqrt{2} - 1}{\sqrt{2} + 1}$ <p>Answer: _____</p>	<p>10. Rationalize using the conjugate:</p> $\frac{4}{\sqrt{6} - \sqrt{2}}$ <p>Answer: _____</p>

Based on the Numberbender lesson "Algebra - Rationalizing Radicals" • youtu.be/B_XtM2fXmCQ

Answer Key & Solutions

Algebra: Rationalizing Radicals • Numberbender

TEACHER NOTES

Items 1–6: monomial radical denominator — multiply by \sqrt{n} / \sqrt{n} to clear it. Items 7–10: binomial radical denominator — multiply by the conjugate (change the sign between terms) to use the difference-of-squares pattern.

1. Rationalize the denominator: $1 / \sqrt{3}$

Answer: $\sqrt{3} / 3$

Multiply by $\sqrt{3}/\sqrt{3}$: $(1 \cdot \sqrt{3}) / (\sqrt{3} \cdot \sqrt{3}) = \sqrt{3}/3$.

2. Rationalize the denominator: $5 / \sqrt{7}$

Answer: $5\sqrt{7} / 7$

Multiply by $\sqrt{7}/\sqrt{7}$: $5\sqrt{7} / 7$.

3. Rationalize the denominator: $8 / \sqrt{2}$

Answer: $4\sqrt{2}$

Multiply by $\sqrt{2}/\sqrt{2}$: $8\sqrt{2} / 2 = 4\sqrt{2}$.

4. Rationalize the denominator: $4 / \sqrt{5}$

Answer: $4\sqrt{5} / 5$

Multiply by $\sqrt{5}/\sqrt{5}$: $4\sqrt{5} / 5$.

5. Rationalize the denominator: $(2 + \sqrt{3}) / \sqrt{3}$

Answer: $2\sqrt{3}/3 + 1$

Multiply by $\sqrt{3}/\sqrt{3}$: $(2\sqrt{3} + 3)/3 = 2\sqrt{3}/3 + 1$.

6. Rationalize the denominator: $6 / \sqrt{12}$

Answer: $\sqrt{3}$

$\sqrt{12} = 2\sqrt{3}$. So $6/(2\sqrt{3}) = 3/\sqrt{3} \cdot \sqrt{3}/\sqrt{3} = 3\sqrt{3}/3 = \sqrt{3}$.

7. Rationalize using the conjugate: $3 / (\sqrt{5} - 2)$

Answer: $3\sqrt{5} + 6$

Conjugate: $(\sqrt{5}+2)$. Multiply: $3(\sqrt{5}+2)/((5-4)) = 3(\sqrt{5}+2) = 3\sqrt{5}+6$.

8. Rationalize using the conjugate: $6 / (\sqrt{3} + 1)$

Answer: $3\sqrt{3} - 3$

Conjugate: $(\sqrt{3}-1)$. Multiply: $6(\sqrt{3}-1)/((3-1)) = 6(\sqrt{3}-1)/2 = 3(\sqrt{3}-1)$.

9. Rationalize using the conjugate: $(\sqrt{2} - 1) / (\sqrt{2} + 1)$

Answer: $3 - 2\sqrt{2}$

Multiply by $(\sqrt{2}-1)/(\sqrt{2}-1)$: $(2 - 2\sqrt{2} + 1)/(2-1) = 3 - 2\sqrt{2}$.

10. Rationalize using the conjugate: $4 / (\sqrt{6} - \sqrt{2})$

Answer: $\sqrt{6} + \sqrt{2}$

Multiply by $(\sqrt{6}+\sqrt{2})/(\sqrt{6}+\sqrt{2})$: $4(\sqrt{6}+\sqrt{2})/((6-2)) = 4(\sqrt{6}+\sqrt{2})/4 = \sqrt{6}+\sqrt{2}$.