

# HOMWORK: RADICAL PROPERTIES

NAME: \_\_\_\_\_

<p>1. Solve. <math> 3x+1  &lt; 10</math></p> $\begin{array}{ccc} -10 < 3x+1 < 10 \\ -1 \quad -1 \quad -1 \\ \hline -11 < \frac{3x}{3} < \frac{9}{3} \\ \hline -\frac{11}{3} < x < 3 \end{array}$	<p>2. <math>-2 x-4 +7=-3</math></p> $\begin{array}{ccc} -7 & -7 & \\ \hline -2 x-4  & = & -10 \\ -2 & -2 & \\ \hline  x-4  & = & 5 \end{array}$ <p><math>x-4=5</math>      <math>x-4=-5</math>  <math>x=9</math>              <math>x=-1</math></p>
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Simplify.

<p>3. <math>\sqrt{200}</math></p> $\sqrt{100} \sqrt{2}$ $10\sqrt{2}$	<p>4. <math>\sqrt[3]{40}</math></p> $\sqrt[3]{8} \sqrt[3]{5}$ $2\sqrt[3]{5}$
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<p>5. <math>5\sqrt[3]{54}</math></p> $5 \sqrt[3]{27} \sqrt[3]{2}$ $5(3) \sqrt[3]{2}$ $15\sqrt[3]{2}$	<p>6. <math>2\sqrt{40} \cdot 5\sqrt{90}</math></p> $10 \sqrt{3600}$ $10(60)$ $600$
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<p>7. <math>\sqrt{8} + \sqrt{50}</math></p> $\sqrt{4}\sqrt{2} + \sqrt{25}\sqrt{2}$ $2\sqrt{2} + 5\sqrt{2}$ $7\sqrt{2}$	<p>8. <math>\sqrt[3]{128} - \sqrt[3]{250}</math></p> $\sqrt[3]{64} \sqrt[3]{2} - \sqrt[3]{125} \sqrt[3]{2}$ $4\sqrt[3]{2} - 5\sqrt[3]{2}$ $-1\sqrt[3]{2}$
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<p>9. <math>\sqrt{\frac{y^2}{100}} = \frac{y}{10}</math></p>	<p>10. <math>\sqrt{300x^5y^8z^{10}}</math></p> $\sqrt{100x^4y^8z^{10}} \sqrt{3x}$ $10x^2y^4z^5 \sqrt{3x}$
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<p>11. <math>\frac{2}{\sqrt[3]{5}} \cdot \sqrt[3]{5^2} = \sqrt[3]{5^3}</math></p> $\frac{2\sqrt[3]{5^2}}{\sqrt[3]{5^3}}$ $\frac{2\sqrt[3]{5^2}}{5}$	<p>12. <math>\frac{4}{(1+3\sqrt{2})(1-3\sqrt{2})}</math></p> $\frac{4-12\sqrt{2}}{1-3\sqrt{2}+3\sqrt{2}-9\sqrt{2}\sqrt{2}}$ $\frac{4-12\sqrt{2}}{1-9(2)}$ $\frac{4-12\sqrt{2}}{-17} = \frac{-4+12\sqrt{2}}{17}$
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<p>11. <math>\frac{2\sqrt[3]{5^2}}{5}</math></p>	<p>12. <math>\frac{-4+12\sqrt{2}}{17}</math></p>
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Simplify.

13.  $4\sqrt{8}\sqrt{3} \cdot 2\sqrt{32}$   
 $4\sqrt{4}\sqrt{2}\sqrt{3} \cdot 2\sqrt{16}\sqrt{2}$   
 $4(2)\sqrt{6} \cdot 2(4)\sqrt{2}$   
 $8\sqrt{6} \cdot 8\sqrt{2}$   
 $64\sqrt{12}$

14.  $\sqrt{27} + \sqrt{12} - \sqrt{75}$   
 $\sqrt{9}\sqrt{3} + \sqrt{4}\sqrt{3} - \sqrt{5}\sqrt{3}$   
 $3\sqrt{3} + 2\sqrt{3} - 5\sqrt{3}$   
 $0\sqrt{3}$   
 $0$

Solve.

(+) 17.  $2x^2 + 5 = 205$   
 $\begin{array}{r} -5 \quad -5 \\ \hline 2x^2 = 200 \\ \hline \frac{2x^2}{2} = \frac{200}{2} \\ \sqrt{x^2} = \sqrt{100} \\ X = \pm 10 \end{array}$

18.  $x^5 + 1 = 65$   
 $\begin{array}{r} -1 \quad -1 \\ \hline \sqrt[5]{x^5} = \sqrt[5]{64} \\ X = \sqrt[5]{64} \\ X = \sqrt[5]{32} \sqrt[5]{2} \end{array}$   $X = 2\sqrt[5]{2}$

19.  $2(x-4)^3 - 2 = -110$   
 $\begin{array}{r} +2 \quad +2 \\ \hline 2(x-4)^3 = -108 \\ \hline \frac{2(x-4)^3}{2} = \frac{-108}{2} \\ \sqrt[3]{(x-4)^3} = \sqrt[3]{-54} \\ X-4 = \sqrt[3]{-27} \sqrt[3]{2} \\ X-4 = -3\sqrt[3]{2} \\ +4 \quad +4 \\ X = 4 - 3\sqrt[3]{2} \end{array}$

(+) 20.  $\frac{1}{3}(x+2)^4 + 4 = 20$   
 $\begin{array}{r} -4 \quad -4 \\ \hline 3 \cdot \frac{1}{3}(x+2)^4 = 16 \cdot 3 \\ \sqrt[4]{(x+2)^4} = \sqrt[4]{48} \\ X+2 = \pm \sqrt[4]{48} \\ X+2 = \pm \sqrt[4]{16} \sqrt[4]{3} \\ X+2 = \pm 2\sqrt[4]{3} \\ -2 \quad -2 \\ X = -2 \pm 2\sqrt[4]{3} \end{array}$

Reach for the stars...

23.  $10(3\sqrt{5})^2 + (2\sqrt{3})^2$   
 $10(3^2\sqrt{5}^2) + 2^2\sqrt{3}^2$   
 $10(9 \cdot 5) + 4(3)$   
 $10(45) + 12$   
 $450 + 12$   
 $462$