

6.3-6.4 Review

Simplify the following:

<p>1. $3\sqrt{32} + 2\sqrt{50}$ $3\sqrt{16} \sqrt{2} + 2\sqrt{25} \sqrt{2}$ $3 \cdot 4\sqrt{2} + 2 \cdot 5\sqrt{2}$ $12\sqrt{2} + 10\sqrt{2}$ $22\sqrt{2}$</p>	<p>2. $2\sqrt[4]{48} + 3\sqrt[4]{243}$ $2\sqrt[4]{16} \sqrt[4]{3} + 3\sqrt[4]{81} \sqrt[4]{3}$ $2 \cdot 2\sqrt[4]{3} + 3 \cdot 3\sqrt[4]{3}$ $4\sqrt[4]{3} + 9\sqrt[4]{3}$ $13\sqrt[4]{3}$</p>	<p>3. $\sqrt[3]{81} - 3\sqrt[3]{3}$ $\sqrt[3]{27} \sqrt[3]{3} - 3\sqrt[3]{3}$ $3\sqrt[3]{3} - 3\sqrt[3]{3}$ 0</p>
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Multiply the following:

<p>4. $(1 - \sqrt{5})(2 - \sqrt{5})$ $2 - \sqrt{5} - 2\sqrt{5} + 5$ $2 - 3\sqrt{5} + 5$ $7 - 3\sqrt{5}$</p>	<p>5. $(2\sqrt{3} - 3\sqrt{2})^2$ $(2\sqrt{3} - 3\sqrt{2})(2\sqrt{3} - 3\sqrt{2})$ $4 \cdot 3 - 6\sqrt{6} - 6\sqrt{6} + 9 \cdot 2$ $12 - 12\sqrt{6} + 18$ $30 - 12\sqrt{6}$</p>	<p>6. $(1 - 3\sqrt{7})(4 - 3\sqrt{7})$ $4 - 3\sqrt{7} - 12\sqrt{7} + 9 \cdot 7$ $4 - 15\sqrt{7} + 63$ $67 - 15\sqrt{7}$</p>
<p>7. $(3\sqrt{y} - \sqrt{5})(2\sqrt{y} + 5\sqrt{5})$ $6 \cdot y + 15\sqrt{5y} - 2\sqrt{5y} - 5 \cdot 5$ $6y + 13\sqrt{5y} - 25$ $6y - 25 + 13\sqrt{5y}$</p>	<p>8. $(\sqrt{2} + 4\sqrt{5})(1 - \sqrt{7})$ $\sqrt{2} - \sqrt{14} + 4\sqrt{5} - 4\sqrt{35}$</p>	<p>9. $(3\sqrt{2} - 2\sqrt{3})(3\sqrt{2} + 2\sqrt{3})$ $9 \cdot 2 + 6\sqrt{6} - 6\sqrt{6} - 4 \cdot 3$ $18 - 12$ 6</p>

Rationalize the denominator. Simplify your answer.

<p>10. $\frac{(3 - \sqrt{10})(\sqrt{5} + \sqrt{2})}{(\sqrt{5} - \sqrt{2})(\sqrt{5} + \sqrt{2})}$ $\frac{3\sqrt{5} + 3\sqrt{2} - \sqrt{50} - \sqrt{20}}{5 + \sqrt{10} - \sqrt{10} - 2}$ $\frac{3\sqrt{5} + 3\sqrt{2} - 5\sqrt{2} - 2\sqrt{5}}{3}$ $\frac{\sqrt{5} - 2\sqrt{2}}{3}$</p>	<p>11. $\frac{(2 + \sqrt{14})(\sqrt{7} - \sqrt{2})}{(\sqrt{7} + \sqrt{2})(\sqrt{7} - \sqrt{2})}$ $\frac{2\sqrt{7} - 2 + \sqrt{98} - \sqrt{28}}{7 - \sqrt{14} + \sqrt{14} - 2}$ $\frac{2\sqrt{7} - 2 + 7\sqrt{2} - 2\sqrt{7}}{5}$ $\frac{-2 + 7\sqrt{2}}{5}$</p>	<p>12. $\frac{(2 + \sqrt[3]{x})\sqrt[3]{x^2}}{(\sqrt[3]{x})\sqrt[3]{x^2}}$ $\frac{2\sqrt[3]{x^2} + \sqrt[3]{x^3}}{\sqrt[3]{x^3}}$ $\frac{2\sqrt[3]{x^2} + x}{x}$</p>
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Simplify. Assume variables are positive.

<p>13. $\sqrt{28} + 4\sqrt{63} - 2\sqrt{7}$ $\sqrt{4} \sqrt{7} + 4 \cdot \sqrt{9} \sqrt{7} - 2\sqrt{7}$ $2\sqrt{7} + 4 \cdot 3\sqrt{7} - 2\sqrt{7}$ $2\sqrt{7} + 12\sqrt{7} - 2\sqrt{7}$ $12\sqrt{7}$</p>	<p>14. $6\sqrt{45y^2} + 4\sqrt{20y^2}$ $6 \cdot \sqrt{9} \sqrt{5y^2} + 4 \cdot \sqrt{4} \sqrt{5y^2}$ $6 \cdot 3\sqrt{5y^2} + 4 \cdot 2\sqrt{5y^2}$ $18y\sqrt{5} + 8y\sqrt{5}$ $26y\sqrt{5}$</p>	<p>15. $4\sqrt[3]{81} + 2\sqrt[3]{72} - 3\sqrt[3]{24}$ $4\sqrt[3]{27} \sqrt[3]{3} + 2\sqrt[3]{8} \sqrt[3]{9} - 3\sqrt[3]{8} \sqrt[3]{3}$ $4 \cdot 3\sqrt[3]{3} + 2 \cdot 2\sqrt[3]{9} - 3 \cdot 2\sqrt[3]{3}$ $12\sqrt[3]{3} + 4\sqrt[3]{9} - 6\sqrt[3]{3}$ $6\sqrt[3]{3} + 4\sqrt[3]{9}$</p>
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Simplify each expression. Write your answers in radical form if necessary.

<p>16. $125^{\frac{1}{2}}$ $\sqrt{125}$ $\sqrt{25} \sqrt{5}$ $5\sqrt{5}$</p>	<p>17. $7^{\frac{1}{2}} \cdot 28^{\frac{1}{2}}$ $\sqrt{7} \sqrt{28}$ $\sqrt{196}$ 14</p>	<p>18. $8^{\frac{1}{4}} \cdot 32^{\frac{1}{4}}$ $\sqrt[4]{8} \cdot \sqrt[4]{32}$ $\sqrt[4]{256}$ 4</p>
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Write each expression in radical form.

<p>19. $x^{\frac{4}{3}}$ $\sqrt[3]{x^4}$ $x \sqrt[3]{x}$</p>	<p>20. $(2y)^{\frac{1}{3}}$ $\sqrt[3]{2y}$</p>	<p>21. $m^{\frac{12}{5}}$ $\sqrt[5]{m^{12}}$ $m^2 \sqrt[5]{m^2}$</p>
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Write each expression in exponential form.

<p>22. $\sqrt[3]{2y^2}$ $(2y^2)^{\frac{1}{3}}$ $2^{\frac{1}{3}} y^{\frac{2}{3}}$</p>	<p>23. $(\sqrt[3]{b})^3$ $b^{\frac{3}{4}}$</p>	<p>24. $\sqrt[4]{(5ab)^3}$ $(5ab)^{\frac{3}{4}}$ $5^{\frac{3}{4}} a^{\frac{3}{4}} b^{\frac{3}{4}}$</p>
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Write each expression in simplest form. Assume that all variables are positive. Give answers as radicals where necessary.

<p>25. $(2a^4)^{\frac{3}{4}}$ $2^{\frac{3}{4}} a^{\frac{3}{4}}$ $8 \sqrt[4]{a^3}$</p>	<p>26. $\frac{x^{\frac{4}{7}}}{x^{\frac{2}{3}}}$ $\frac{4}{7} - \frac{2}{3} = \frac{12}{21} - \frac{14}{21}$ $-\frac{2}{21}$ $x^{-\frac{2}{21}} = \frac{1}{x^{\frac{2}{21}}}$ $\frac{1}{\sqrt[21]{x^2}} \cdot \frac{\sqrt[21]{x^{19}}}{\sqrt[21]{x^{19}}} = \frac{\sqrt[21]{x^{19}}}{x x^{\frac{1}{21}}}$</p>	<p>27. $(2x^{\frac{2}{3}})(6x^{\frac{1}{4}})$ $\frac{2}{3} + \frac{1}{4} = \frac{8}{12} + \frac{3}{12} = \frac{11}{12}$ $12 x^{\frac{11}{12}}$ $12 \sqrt[12]{x^{11}}$</p>
<p>28. $\frac{x^{\frac{1}{2}} y^{\frac{2}{3}}}{x^{\frac{1}{3}} y^{\frac{1}{2}}}$ $x^{\frac{1}{6}} y^{\frac{1}{6}}$ $\sqrt[6]{xy}$ $\frac{1}{2} - \frac{1}{3} = \frac{3}{6} - \frac{2}{6} = \frac{1}{6}$ $\frac{1}{2} - \frac{1}{3} = \frac{3}{6} - \frac{2}{6} = \frac{1}{6}$</p>	<p>29. $(\frac{27x^6}{64y^4})^{\frac{1}{3}}$ $\frac{27^{\frac{1}{3}} x^{\frac{6}{3}}}{64^{\frac{1}{3}} y^{\frac{4}{3}}}$ $\frac{\sqrt[3]{27} x^2}{\sqrt[3]{64} y^{\frac{4}{3}}} = \frac{3x^2}{4y \sqrt[3]{y}}$ $\frac{3x^2 \sqrt[3]{y^2}}{4y^2}$</p>	<p>30. $(\frac{x^{-\frac{1}{3}} y}{x^{\frac{2}{3}} y^{-\frac{1}{2}}})^2$ $\frac{x^{-\frac{2}{3}} y^2}{x^{\frac{4}{3}} y^{-1}}$ $\frac{y^3}{x^{\frac{4}{3}}} = \frac{y^3}{x^{\frac{4}{3}}}$</p>