

Simplifying Radicals Worksheet (Extra Questions) (Solutions at the end of the assignment!)

Simplify the following. Rationalize the denominator if needed.

1. $\sqrt{120}$

2. $-3\sqrt{40}$

3. $\sqrt[3]{88}$

4. $-2\sqrt[3]{54}$

5. $(3\sqrt{5})(4\sqrt{10})$

6. $(-2\sqrt{6})(3\sqrt{3})$

7. $\sqrt{x^2y^7}$

8. $\sqrt[3]{8x^4y^7}$

9. $(2x^2\sqrt{2x})(3x\sqrt{2x^3})$

10. $(2+\sqrt{5})(3+\sqrt{5})$

11. $4\sqrt{2}(2\sqrt{3}-\sqrt{2})$

12. $(\sqrt{6}+2\sqrt{3})(\sqrt{6}-2\sqrt{3})$

13. $\frac{\sqrt{20}}{\sqrt{5}}$

14. $\frac{3}{\sqrt{3}}$

15. $\frac{\sqrt{2}}{\sqrt{5}-\sqrt{2}}$

16. $\frac{\sqrt{3}+2}{2\sqrt{3}-2}$

Solutions to Simplifying Radicals Worksheet

$$1. \sqrt{120} = \sqrt{4}\sqrt{30} = 2\sqrt{30}$$

$$2. -3\sqrt{40} = -3 \cdot \sqrt{4}\sqrt{10} = -3 \cdot 2\sqrt{10} = -6\sqrt{10}$$

$$3. \sqrt[3]{88} = \sqrt[3]{8}\sqrt[3]{11} = 2\sqrt[3]{11}$$

$$4. -2\sqrt[3]{54} = -2 \cdot \sqrt[3]{27}\sqrt[3]{2} = -2 \cdot 3\sqrt[3]{2} = -6\sqrt[3]{2}$$

$$5. (3\sqrt{5})(4\sqrt{10}) = 12\sqrt{50} = 12 \cdot \sqrt{25}\sqrt{2} = 12 \cdot 5\sqrt{2} = 60\sqrt{2}$$

$$6. (-2\sqrt{6})(3\sqrt{3}) = -6\sqrt{18} = -6 \cdot \sqrt{9}\sqrt{2} = -6 \cdot 3\sqrt{2} = -18\sqrt{2}$$

$$7. \sqrt{x^2y^7} = \sqrt{x^2y^6}\sqrt{y} = xy^3\sqrt{y}$$

$$8. \sqrt[3]{8x^4y^7} = \sqrt[3]{8x^3y^6}\sqrt[3]{xy} = 2xy^2\sqrt[3]{xy}$$

$$9. (2x^2\sqrt{2x})(3x\sqrt{2x^3}) = 6x^3\sqrt{4x^4} = 6x^3 \cdot 2x^2 = 12x^5$$

$$10. (2 + \sqrt{5})(3 + \sqrt{5}) = 6 + 2\sqrt{5} + 3\sqrt{5} + 5 = 11 + 5\sqrt{5}$$

$$11. 4\sqrt{2}(2\sqrt{3} - \sqrt{2}) = 8\sqrt{6} - 4 \cdot 2 = 8\sqrt{6} - 8$$

$$12. (\sqrt{6} + 2\sqrt{3})(\sqrt{6} - 2\sqrt{3}) = 6 - 2\sqrt{18} + 2\sqrt{18} - 4 \cdot 3 = 6 - 12 = -6$$

$$13. \frac{\sqrt{20}}{\sqrt{5}} = \sqrt{4} = 2$$

$$14. \frac{3}{\sqrt{3}} = \frac{3}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{3\sqrt{3}}{3} = \sqrt{3}$$

$$15. \frac{\sqrt{2}}{\sqrt{5}-\sqrt{2}} = \frac{\sqrt{2}}{\sqrt{5}-\sqrt{2}} \cdot \frac{\sqrt{5}+\sqrt{2}}{\sqrt{5}+\sqrt{2}} = \frac{\sqrt{10}+2}{5-2} = \frac{\sqrt{10}+2}{3}$$

$$16. \frac{\sqrt{3}+2}{2\sqrt{3}-2} = \frac{\sqrt{3}+2}{2\sqrt{3}-2} \cdot \frac{2\sqrt{3}+2}{2\sqrt{3}+2} = \frac{2 \cdot 3 + 2\sqrt{3} + 4\sqrt{3} + 4}{4 \cdot 3 - 4} = \frac{10 + 6\sqrt{3}}{8} = \frac{5 + 3\sqrt{3}}{4}$$