

Simplify (Simplifying Perfect Squares):

1. $\sqrt{4} = 2$ 2. $\sqrt{16} = 4$ 3. $-\sqrt{100} = -10$ 4. $\sqrt{a^8} = a^4$ 5. $\sqrt{w^{12}} = w^6$
6. $\sqrt{a^6 b^{10}} = a^3 b^5$ 7. $\sqrt{9a^2} = 3a$ 8. $-\sqrt{81m^{64}} = -9m^{32}$ 9. $\sqrt{49a^4 b^{12}} = 7a^2 b^6$ 10. $\sqrt{121x^{14}y^6} = 11x^7 y^3$

Simplify (Simplifying Radicals that are not Perfect Squares):

1. $\sqrt{20} = \sqrt{4} \cdot \sqrt{5} = 2\sqrt{5}$ 2. $\sqrt{27} = \sqrt{9} \sqrt{3} = 3\sqrt{3}$ 3. $\sqrt{48} = \sqrt{16} \sqrt{3} = 4\sqrt{3}$
4. $\sqrt{45} = \sqrt{9} \sqrt{5} = 3\sqrt{5}$ 5. $\sqrt{12} = \sqrt{4} \sqrt{3} = 2\sqrt{3}$ 6. $\sqrt{50} = \sqrt{25} \cdot \sqrt{2} = 5\sqrt{2}$
7. $\sqrt{a^5} = \sqrt{a^4} \sqrt{a} = a^2 \sqrt{a}$ 8. $\sqrt{x^9} = \sqrt{x^8} \sqrt{x} = x^4 \sqrt{x}$ 9. $\sqrt{x^3} = \sqrt{x^2} \cdot \sqrt{x} = x \sqrt{x}$

Simplify:

1. $\sqrt{18} = \sqrt{9} \cdot \sqrt{2} = 3\sqrt{2}$ 2. $\sqrt{125} = \sqrt{25} \cdot \sqrt{5} = 5\sqrt{5}$ 3. $\sqrt{72} = \sqrt{36} \cdot \sqrt{2} = 6\sqrt{2}$ 4. $\sqrt{180} = \sqrt{36} \cdot \sqrt{5} = 6\sqrt{5}$ 5. $\sqrt{a^3}$
6. $\sqrt{b^7} = \sqrt{b^6} \cdot \sqrt{b} = b^3 \sqrt{b}$ 7. $\sqrt{m^{11}} = \sqrt{m^{10}} \cdot \sqrt{m} = m^5 \sqrt{m}$ 8. $\sqrt{75x^7 y^5}$ 9. $\sqrt{27a^{11} b^7}$ 10. $\sqrt{32a^7 b^4} = 4a^3 b^2 \sqrt{2a}$
11. $\sqrt{9a^8} = 3a^4$ 12. $\sqrt{45a^7} = \sqrt{9} \cdot \sqrt{5} \cdot \sqrt{a^6} \cdot \sqrt{a} = 3\sqrt{5} a^3 \sqrt{a}$ 13. $\sqrt{36x^2 y^6}$ 14. $\sqrt{12x^{20} y^8}$ 15. $-\sqrt{200} = -\sqrt{100} \cdot \sqrt{2} = -10\sqrt{2}$
16. $\sqrt{196} = 14$ 17. $\sqrt{63x^4 y}$ 18. $\sqrt{6x^3}$ 19. $\sqrt{100x^5 y}$ 20. $\sqrt{80x^{100} y^{49}} = 10\sqrt{2} x^{50} y^{49}$

12) $3a^3 \sqrt{5a}$

$\sqrt{32} = \sqrt{16} \cdot \sqrt{2} = 4\sqrt{2}$ $\sqrt{a^7} = \sqrt{a^6} \cdot \sqrt{a} = a^3 \sqrt{a}$ $\sqrt{b^4} = b^2$

$\sqrt{6} \cdot \sqrt{x^2} \cdot \sqrt{x} = x \sqrt{6x}$

Homework Simplifying Radicals

Name _____

Class Time _____

Simplify each of the following expressions completely.

8 1. $\sqrt{64}$

$-3\sqrt{2}$ 2. $-\sqrt{18}$

$4\sqrt{2}$ 3. $\sqrt{32}$

$5\sqrt{2}$ 4. $\sqrt{50}$

20 5. $\sqrt{400}$

x^3 6. $\sqrt{x^6}$

_____ 7. $\sqrt{x^7}$

_____ 8. $\sqrt{16x^{16}}$

_____ 9. $\sqrt{9x^9}$

_____ 10. $\sqrt{40x^8}$

_____ 11. $\sqrt{25x^7}$

_____ 12. $\sqrt{12x^5}$

_____ 13. $\sqrt{a^2b^4}$

_____ 14. $\sqrt{49a^8x^{12}}$

_____ 15. $\sqrt{28x^9y^6}$

_____ 16. $\sqrt{32m^7n^{11}}$

_____ 17. $\sqrt{20x^{10}y^5}$

_____ 18. $\sqrt{100ab^4}$

_____ 19. $\sqrt{75x^8y^3}$

_____ 20. $\sqrt{98x^7y^5}$

_____ 21. $\frac{x^2+16x+63}{2x^2+19x+9}$

Rationalize the Denominator

Simplify.

$$2) \frac{5}{(\sqrt{5})(\sqrt{5})} = \frac{5\sqrt{5}}{\sqrt{25}} = \frac{5\sqrt{5}}{5} = \sqrt{5}$$

$$4) \frac{6}{\sqrt{3}} \frac{(\sqrt{3})}{(\sqrt{3})} = \frac{6\sqrt{3}}{\sqrt{9}} = \frac{6\sqrt{3}}{3} = 2\sqrt{3}$$

$$6) \frac{2}{\sqrt{7}} \frac{\sqrt{7}}{\sqrt{7}} = \frac{2\sqrt{7}}{\sqrt{49}} = \frac{2\sqrt{7}}{7}$$

$$8) \frac{4}{\sqrt{5}} \frac{\sqrt{5}}{\sqrt{5}} = \frac{4\sqrt{5}}{\sqrt{25}} = \frac{4\sqrt{5}}{5}$$

$$10) \frac{7}{\sqrt{5}}$$

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

$$5) \frac{2}{\sqrt{3}}$$

$$7) \frac{7}{\sqrt{6}}$$

$$9) \frac{4}{\sqrt{6}} \frac{\sqrt{6}}{\sqrt{6}} = \frac{4\sqrt{6}}{\sqrt{36}} = \frac{4\sqrt{6}}{6} \\ = \frac{2\sqrt{6}}{3}$$

$$11) -\frac{4}{\sqrt{7}}$$

Simplify

$$\frac{5}{\sqrt{12}}$$

$$\sqrt{12} = 2\sqrt{3}$$

$$\begin{aligned}\frac{5}{2\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} &= \frac{5\sqrt{3}}{2\sqrt{9}} \\ &= \frac{5\sqrt{3}}{2 \cdot 3} \\ &= \frac{5\sqrt{3}}{6}\end{aligned}$$

$$\begin{aligned}\frac{5\sqrt{12}}{12} &= \frac{5 \cdot 2\sqrt{3}}{12} = \frac{10\sqrt{3}}{12} \\ &= \frac{5\sqrt{3}}{6}\end{aligned}$$