

P4-2 Solutions

Simplify.

$$1. \sqrt{540} - 6\sqrt{15}$$

$$2. \sqrt[3]{-432} - 6\sqrt[3]{2}$$

$$3. \sqrt[4]{128} - 4\sqrt[4]{2}$$

$$4. -\sqrt[4]{405} - 3\sqrt[4]{5}$$

$$5. \sqrt[5]{-5000} - 10\sqrt[5]{5}$$

$$6. \sqrt[5]{-1215} - 3\sqrt[5]{5}$$

$$7. \sqrt[3]{125t^6w^9} - 5t^2\sqrt[3]{w^3}$$

$$8. \sqrt[4]{48a^8z^{12}} - 2v^2z^3\sqrt[4]{3z}$$

$$9. \sqrt[3]{8g^3k^8} - 2gk^2\sqrt[3]{k^2}$$

$$10. \sqrt{45x^3y^8} - 3xy^4\sqrt{5x}$$

$$11. \sqrt{\frac{11}{9}} - \frac{\sqrt{11}}{3}$$

$$12. \sqrt[3]{\frac{216}{24}} - \sqrt[3]{9}$$

$$13. \sqrt{\frac{1}{128}c^4d^7} - \frac{1}{16}c^2d^3\sqrt{2d}$$

$$14. \sqrt{\frac{9a^5}{64b^4}} - \frac{3a^2\sqrt{a}}{8b^2}$$

$$15. \sqrt[4]{\frac{8}{9a^3}} - \frac{\sqrt[4]{72a}}{3a}$$

$$16. (3\sqrt{15}) - 4\sqrt{45} \\ -18\sqrt{5}$$

$$17. (2\sqrt{24})(7\sqrt{18}) \\ 168\sqrt{3}$$

$$18. \sqrt{810} + \sqrt{240} - \sqrt{250} \\ 4\sqrt{10} + 4\sqrt{15}$$

$$19. 6\sqrt{20} + 8\sqrt{5} - 5\sqrt{45} \\ 5\sqrt{5}$$

$$20. 8\sqrt{48} - 6\sqrt{75} + 7\sqrt{80} \\ 2\sqrt{3} + 28\sqrt{5}$$

$$21. 13\sqrt{2} + 2\sqrt{3}^2 \\ 30 + 12\sqrt{6}$$

$$22. (3 - \sqrt{7})^2 \\ 16 - 6\sqrt{7}$$

$$23. (\sqrt{5} - \sqrt{6})(\sqrt{5} + \sqrt{2}) \\ 5 + \sqrt{10} - \sqrt{30} - 2\sqrt{3} - 8$$

$$24. (\sqrt{2} + \sqrt{10})(\sqrt{2} - \sqrt{10}) \\ -8$$

$$25. (1 + \sqrt{6})(5 - \sqrt{7}) \\ 5 - \sqrt{7} + 5\sqrt{6} - \sqrt{42}$$

$$26. (\sqrt{3} + 4\sqrt{7})^2 \\ 115 + 8\sqrt{21}$$

$$27. (\sqrt{108} - 6\sqrt{3})^2 \\ 0$$

$$28. \frac{\sqrt{3}}{\sqrt{5}-2} \sqrt{15} + 2\sqrt{3}$$

$$29. \frac{6}{\sqrt{2}-1} 6\sqrt{2} + 6$$

$$30. \frac{5 + \sqrt{3}}{4 + \sqrt{3}} \frac{17 - \sqrt{3}}{13}$$

$$31. \frac{3 + \sqrt{2}}{2} \frac{8 + 5\sqrt{2}}{2}$$

$$32. \frac{3 + \sqrt{6}}{5 - \sqrt{24}} 27 + 11\sqrt{6}$$

$$33. \frac{3 + \sqrt{x}}{2 - \sqrt{x}} \frac{6 + 5\sqrt{x} + x}{4 - x}$$

34. **BRAKING** The formula $s = 2\sqrt{5t}$ estimates the speed s in miles per hour of a car when it leaves skid marks t feet long. Use the formula to write a simplified expression for s if $t = 85$. Then evaluate s to the nearest mile per hour. $10\sqrt{17}$; 41 mi/h

35. **PYTHAGOREAN THEOREM** The measures of the legs of a right triangle can be represented by the expressions $6x^2y$ and $9x^2y$. Use the Pythagorean Theorem to find a simplified expression for the measure of the hypotenuse. $3x^2|y|\sqrt{13}$

Simplifying Rational Exponents

Date _____ Period _____

Simplify.

1) $(n^4)^{\frac{3}{2}}$
 n^6

2) $(27p^6)^{\frac{5}{3}}$
 $243p^{10}$

3) $(25b^6)^{-1.5}$
 $\frac{1}{125b^9}$

4) $(64m^4)^{\frac{3}{2}}$
 $512m^6$

5) $(a^8)^{\frac{3}{2}}$
 a^{12}

6) $(9r^4)^{0.5}$
 $3r^2$

7) $(81x^{12})^{1.25}$
 $243x^{15}$

8) $(216r^9)^{\frac{1}{3}}$
 $6r^3$

Simplify. Your answer should contain only positive exponents with no fractional exponents in the denominator.

9) $2m^2 \cdot 4m^{\frac{3}{2}} \cdot 4m^{-2}$
 $32m^{\frac{3}{2}}$

10) $3b^{\frac{1}{2}} \cdot b^{\frac{4}{3}}$
 $3b^{\frac{11}{6}}$

11) $\left(p^{\frac{3}{2}}\right)^{-2}$
 $\frac{1}{p^3}$

12) $\left(a^{\frac{1}{2}}\right)^{\frac{3}{2}}$
 $a^{\frac{3}{4}}$

$$13) \frac{2x^{-\frac{7}{4}}}{4x^{\frac{4}{3}}}$$

$$\frac{x^{\frac{11}{12}}}{2x^4}$$

$$14) \frac{4x^2}{2x^{\frac{1}{2}}}$$

$$2x^{\frac{3}{2}}$$

$$15) \frac{3x^{-\frac{1}{2}} \cdot 3x^{\frac{1}{2}} y^{-\frac{1}{3}}}{3y^{-\frac{7}{4}}}$$

$$3y^{\frac{17}{12}}$$

$$16) \frac{3y^{\frac{1}{4}}}{4x^{-\frac{2}{3}} y^{\frac{3}{2}} \cdot 3y^{\frac{1}{2}}}$$

$$\frac{x^{\frac{2}{3}} y^{\frac{1}{4}}}{4y^2}$$

$$17) \left(m \cdot m^{-2} n^{\frac{5}{3}}\right)^2$$

$$\frac{n^{\frac{10}{3}}}{m^2}$$

$$18) \left(a^{-1} b^{\frac{1}{3}} \cdot a^{-\frac{4}{3}} b^2\right)^2$$

$$\frac{a^{\frac{1}{3}} b^{\frac{14}{3}}}{a^5}$$

$$19) \left(\frac{x^{\frac{1}{2}} y^{-2}}{yx^{-\frac{7}{4}}}\right)^4$$

$$\frac{x^9}{y^{12}}$$

$$20) \frac{(x^3 y^2)^{\frac{3}{2}}}{\left(x^{-1} y^{-\frac{2}{3}}\right)^4}$$

$$y^{\frac{19}{6}} x^{\frac{19}{4}}$$

$$21) \frac{\left(x^{-\frac{1}{2}} y^2\right)^{-\frac{5}{4}}}{x^2 y^{\frac{1}{2}}}$$

$$\frac{x^{\frac{5}{8}}}{y^{\frac{3}{2}} x^{\frac{1}{2}}}$$

$$22) \frac{\left(x^{-\frac{1}{2}} y^4\right)^{\frac{1}{4}}}{x^{\frac{2}{3}} y^{\frac{3}{2}} \cdot x^{-\frac{3}{2}} y^{\frac{1}{2}}}$$

$$\frac{x^{\frac{17}{24}}}{y}$$