

Radicals and Exponents Solutions

Laws of exponents:

If a and b are positive numbers, and x and y are any real numbers, then

$$1. a^{x+y} = a^x a^y$$

$$2. a^{x-y} = \frac{a^x}{a^y}$$

$$3. (a^x)^y = a^{xy}$$

$$4. (ab)^x = a^x b^x$$

Simplify the following expressions:

$$1. \frac{8x^{n+2}}{6x^3} = \frac{4x^{n-1}}{3}$$

$$2. (x^{r+2})(x^{r+3}) = x^{2r+5}$$

$$3. \sqrt[2]{b^7} = b^{\frac{7}{2}}$$

$$4. \frac{x^7}{x^5} = x^2$$

$$5. \sqrt{49b^6} + \sqrt{\frac{b^4}{4a^2}} = 7b^3 + \frac{b^2}{2a}$$

$$6. x^5 y^5 = (xy)^5$$

$$7. (x^2)^3 = x^6$$

$$8. (x^2)(x^3) = x^5$$

Simplify the following expressions:

$$9. \sqrt[3]{a^2b^6} = a^{\frac{2}{3}}b^2$$

$$10. \frac{3r^{k-1}}{r^{k+4}} = 3r^{-5} = \frac{3}{r^5}$$

$$11. \left(\frac{-2x^{\frac{1}{3}}}{y^{\frac{1}{2}}}\right)^3 = \frac{-8x}{\sqrt{y^3}} = \frac{-8x}{y^{\frac{3}{2}}}$$

$$12. 16^{\frac{1}{2}} \cdot 27^{-\frac{2}{3}} = \frac{4}{9}$$

$$13. 125^{-\frac{1}{3}} \cdot 8^{\frac{2}{3}} = \frac{4}{5}$$

$$14. 4^{-\frac{3}{2}} \cdot 16^{-\frac{1}{4}} = \frac{1}{16}$$

$$15. 64^{\frac{1}{3}} = 4$$

$$16. \frac{5r^{k-1}}{r^{k+3}} = 5r^{-4} = \frac{5}{r^4}$$