

Radicals and Exponents Solution

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:

$$a. (8x^{n+2})/6x^3 = (4x^{n-1})/3$$

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

$$c. \sqrt[2]{b^7} = b^{7/2}$$

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

$$e. \sqrt{49b^6} + \sqrt{\frac{b^4}{4a^2}} = 7b^3 + (b^2/2a)$$

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

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

$$h. x^2x^3 = x^5$$

$$i. \sqrt[3]{a^2b^6} = (a^{2/3})b^2$$

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

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

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

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

$$n. 4^{-\left(\frac{3}{2}\right)} \cdot 16^{\frac{1}{4}} = 1/4$$

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

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