

Simplify each monomial

$$1) \left(\frac{x^7 y^{-2} z^8}{9x^4 y z^{-2}} \right)^{-3} \frac{729 x^{12} y^6 z^3}{x^4 z^{30}}$$

$$2) 10(3x^4 y^5)^2 \cdot (2x^4 y^6)$$

$$3) x^{1/3} \cdot \sqrt{9x^6}$$

Solve each of the following. (Check for extraneous solutions)

$$4) 11\sqrt[4]{x^2} + 7 = 29$$

$$\begin{aligned} 11\sqrt[4]{x^2} &= 22 \\ \sqrt[4]{x^2} &= 2 \\ x^2 &= 16 \\ x &= \pm 4 \end{aligned}$$

$$5) 2x^{2/3} - 2 = 16 \text{ (Why does this equation have two solutions?)}$$

$$\begin{aligned} 2\sqrt[3]{x^2} &= 18 \\ \sqrt[3]{x^2} &= 9 \\ x^2 &= 9^3 \\ x &= \pm 27 \end{aligned}$$

↓ I took an even root

$$6) \sqrt{2x+7} + 4 = x$$

$$\sqrt{2x+7} = x$$

$$7) 3(x+5)^{3/5} - 1 = 23$$

$$8) \frac{x+5}{x} = \frac{x+1}{3}$$

$$9) \text{System: } \begin{cases} \frac{x}{y} = \frac{y}{x+16} \\ -2x + y = -3 \end{cases}$$

Solve each system

$$10) y = -x^2 - 1 \text{ and } y = -x - 3$$

$$11) y = x^2 \text{ and } y = x$$

$$12) y = 2x^2 - 6x + 5 \text{ and } y = x + 5$$

$$13) x^2 + y^2 = 125 \text{ and } y = 2x$$

$$14) x^2 + y^2 = 25 \text{ and } y = x + 1$$