

5.1

$$1) 4 \cdot 4^4 \cdot 4^4 = 4^9$$

$$19) \frac{3^2}{3} = 3$$

$$3) 4 \cdot 2^2 = 2^2 \cdot 2^2 = 2^4$$

$$21) \frac{3nm^2}{3n} = m^2$$

$$5) 3m \cdot 4mn = 12m^2n$$

$$23) \frac{4x^3y^4}{3xy^3} = \frac{4x^2y}{3}$$

$$7) 2m^4n^2 \cdot 4nm^2 = 8m^6n^3$$

$$9) (3^3)^4 = 3^{12}$$

$$25) (x^3y^4 \cdot 2x^2y^3)^2 \\ (2x^5y^7)^2 \\ 2^2x^{10}y^{14} \\ 4x^{10}y^{14}$$

$$11) (4^4)^2 = 4^8$$

$$13) (2u^3v^2)^2 = 4u^6v^4$$

$$27) 2x(x^4y^4)^4 \\ 2x(x^{16}y^{16}) \\ 2x^{17}y^{16}$$

$$15) (2a^4)^4 = 2^4a^{16} = 16a^{16}$$

$$17) \frac{4^5}{4^3} = 4^2$$

$$29) \frac{2x^7y^5}{3x^3y \cdot 4x^2y^3} = \frac{2x^7y^5}{12x^5y^4} = \frac{x^2y}{6}$$

$$31) \left(\frac{(2x)^3}{x^3}\right)^2 = \left(\frac{2^3x^3}{x^3}\right)^2 = \left(\frac{8x^3}{x^3}\right)^2 = 8^2 = 64$$

$$33) \left(\frac{2y^{17}}{(2x^2y^4)^4}\right)^3 = \left(\frac{2y^{17}}{2^4x^8y^{16}}\right)^3 = \left(\frac{2y^{17}}{16x^8y^{16}}\right)^3 = \left(\frac{y}{8x^8}\right)^3 = \frac{y^3}{8^3x^{24}} = \frac{y^3}{512x^{24}}$$

$$35) \left(\frac{2mn^4 \cdot 2m^4n^4}{mn^4}\right)^3 = \left(\frac{4m^5n^8}{mn^4}\right)^3 = (4m^4n^4)^3 = 4^3m^{12}n^{12} = 64m^{12}n^{12}$$

$$37) \frac{2xy^5 \cdot 2x^2y^3}{2xy^4 \cdot y^3} = \frac{4x^3y^8}{2xy^7} = 2x^2y$$

$$39) \frac{q^3r^2 \cdot (2p^2q^2r^3)^2}{2p^3} = \frac{q^3r^2(2^2p^4q^4r^2)}{2p^3} = \frac{q^3r^2 \cdot 4p^4q^4r^6}{2p^3} = \frac{4p^4q^7r^8}{2p^3} = 2pq^7r^8$$

$$41) \left(\frac{zy^3 \cdot z^3x^4y^4}{x^3y^3z^3}\right)^4 = \left(\frac{z^4y^7x^4}{x^3y^3z^3}\right)^4 = (xy^4z)^4 = x^4y^{16}z^4$$

$$43) \frac{2x^2y^2z^6 \cdot 2zx^2y^2}{(x^2z^3)^2} = \frac{4x^4y^4z^7}{x^4z^6} = 4y^4z$$