

$$(4x)^3 = (4x)(4x)(4x) = (4 \cdot 4 \cdot 4)(x \cdot x \cdot x) = 4^3 x^3 = 64x^3$$

$$[4(x + 1)]^2 = 4^2(x + 1)^2 = 16(x + 1)^2$$

$$(x^2y)^4 = (x^2)^4 y^4 = x^8 y^4$$

$$(2x)^{-3} = \frac{1}{(2x)^3} = \frac{1}{2^3 x^3} = \frac{1}{8x^3}$$

$$(2x^{-1})^{-3} = 2^{-3}(x^{-1})^{-3} = \frac{1}{2^3} x^{(-1)(-3)} = \frac{1}{8} x^3$$

$$\begin{aligned} [(5x + 8)^2(x + 6)]^4 &= [(5x + 8)^2]^4(x + 6)^4 \\ &= (5x + 8)^{(2)(4)}(x + 6)^4 = (5x + 8)^8(x + 6)^4 \end{aligned}$$

$$(4x^3y)^2 = 4^2(x^3)^2 y^2 = 16x^{(3)(2)} y^2 = 16x^6 y^2$$

$$4(3x)^3 = 4(3^3 x^3) = 4(27x^3) = 108x^3$$