

4.1

ex $t \cdot t \cdot t \cdot t \cdot t \cdot t \cdot t = t^7$

ex $(-8\rho)(-8\rho) = (-8\rho)^2$

ex $(5x)^3$ means $(5x)(5x)(5x)$

$5x^3$ means $5 \cdot x \cdot x \cdot x$

ex 2^7 ← exponent = 128
 2 ← base

ex $(-2)^7$ ← exponent = -128
 (-2) ← base

ex $3^6 \cdot 3^7 = 3^{13}$ Rule: $a^m \cdot a^n = a^{m+n}$

ex $n^5 \cdot n^6 \cdot n^9 = n^{20}$

ex $(-5w^8)(-9w^8) = 45w^{16}$

ex $(y^6)^5 = y^{30}$ Rule: $(a^m)^n = a^{mn}$

ex $(11x)^4 = 11^4 x^4$

ex $(9pq)^6 = 9^6 p^6 q^6$

ex $(-9^4)^8 = 9^{32}$

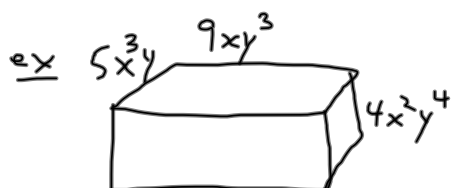
ex $(-7^5)^7 = -7^{35}$

$$\underline{\text{ex}} \quad (6y)^5(6y)^8 = (6y)^{13} = 6^{13}y^{13}$$

$$\text{or} = 6^5y^5 \cdot 6^8y^8 = 6^{13}y^{13}$$

$$\underline{\text{ex}} \quad (y^4)^5(y^3)^5 = y^{20} \cdot y^{15} = y^{35}$$

$$\underline{\text{ex}} \quad (-ts^6)^4(-t^3s^5)^3 = (t^4s^{24})(-t^9s^{15}) = -t^{13}s^{39}$$



$$V = lwh = (5x^3y)(9xy^3)(4x^2y^4) \\ = 180x^6y^8$$

4.2

$$2^4 = 16$$

$$2^3 = 8$$

$$2^2 = 4$$

$$2^1 = 2$$

$$2^0 = 1$$

→ Rule: $a^0 = 1$

$$2^{-1} = \frac{1}{2} = \frac{1}{2^1}$$

$$2^{-2} = \frac{1}{4} = \frac{1}{2^2}$$

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

} → Rule: $a^{-n} = \frac{1}{a^n}$

$$\underline{\text{ex}} \quad 5^0 = 1 \quad \underline{\text{ex}} \quad (-10)^0 = 1$$

$$\underline{\text{ex}} \quad -5^0 = -1 \quad \underline{\text{ex}} \quad (-8)^0 - 8^0 = 1 - 1 = 0$$

$$\underline{\text{ex}} \quad 5^{-4} = \frac{1}{5^4} = \frac{1}{625}$$

$$\underline{\text{ex}} \quad \left(\frac{2}{3}\right)^{-3} = \frac{2^{-3}}{3^{-3}} = \frac{3^3}{2^3} = \frac{27}{8}$$

$$\text{or} = \left(\frac{3}{2}\right)^3 = \frac{3^3}{2^3} = \frac{27}{8}$$

$$\underline{\text{ex}} \quad \frac{3}{5^{-8}} = 35^8 \qquad \underline{\text{ex}} \quad \frac{6^{-2}}{5^{-4}} = \frac{5^4}{6^2} = \frac{625}{36}$$

$$\underline{\text{ex}} \quad \frac{a^6}{a^{-4}} = a^6 a^4 = a^{10} \qquad \underline{\text{ex}} \quad \frac{p^{-5} q^{-4}}{9 r^{-3}} = \frac{r^3}{9 p^5 q^4}$$

$$\underline{\text{ex}} \quad \frac{(p-3q)^{-2}}{(p-3q)^{-4}} = \frac{(p-3q)^4}{(p-3q)^2} = (p-3q)^2$$

$$\underline{\text{ex}} \quad y^{-8} \cdot y^5 \cdot y^{-2} = y^{-5} = \frac{1}{y^5}$$

$$\underline{\text{ex}} \quad \frac{(2y)^{-3}}{(5y)^{-4}} = \frac{(5y)^4}{(2y)^3} = \frac{5^4 y^4}{2^3 y^3} = \frac{625 y}{8}$$

$$\underline{\text{ex}} \left(\frac{p^{-4} q}{r^{-3}} \right)^{-3} = \frac{p^{12} q^{-3}}{r^9} = \frac{p^{12}}{r^9 q^3}$$

$$\underline{\text{ex}} \frac{(m^8 n^{-4})^2}{m^{-2} h^5} = \frac{m^{16} n^{-8}}{m^{-2} n^5} = \frac{m^{16} m^2}{n^5 n^8} = \frac{m^{18}}{n^{13}}$$

$$\underline{\text{ex}} \left(\frac{w z^{-5}}{w^{-3} z} \right)^{-2} = \frac{w^{-2} z^{10}}{w^6 z^{-2}} = \frac{z^{10} z^2}{w^6 w^2} = \frac{z^{12}}{w^8}$$

4.3 ex 7.34×10^5 is in scientific notation
 $\underbrace{\quad}$ $\underbrace{\quad}$
 power of 10

between 1 & 9.999...

ex $34,000 \rightarrow 3.4 \times 10^4$

ex $.9 \times 10^3 \rightarrow 9 \times 10^{-1} \times 10^3 = 9 \times 10^2$

ex $.0007 \rightarrow 7 \times 10^{-4}$

ex $8.766 \times 10^9 \rightarrow 8,766,000,000$

ex $8.9 \times 10^{-5} \rightarrow .000089$

$$\underline{\text{ex}} (4 \times 10^{-3})(2 \times 10^7) = 8 \times 10^4 = 80,000$$

$$\underline{\text{ex}} \frac{12 \times 10^{-4}}{4 \times 10^{-3}} = 3 \times 10^{-4} \times 10^3 = 3 \times 10^{-1} = .3$$

$$\underline{\text{ex}} \frac{3 \times 10^9}{6 \times 10^5} = .5 \times 10^4 = 5,000$$