MAT 1275CO - Chapter 1.1.4 Problem Set

1. Simplify and write without using negative exponents.

   (a) $3 \cdot 3^5 \cdot 3^{12}$

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

   (c) $(2x^2 y)^4$

   (d) $x^4 x^{12}$

   (e) $x^{-4} x^{12}$

   (f) $x^4 x^{-12}$

   (g) $x^{-4} x^{-12}$

   (h) $\frac{w^6}{w^{15}}$

   (i) $\frac{w^{-6}}{w^{15}}$

   (j) $\frac{w^6}{w^{-15}}$

   (k) $\frac{w^{-6}}{w^{-15}}$

   (l) $(u^2 v^2 \cdot 2u^4)^3$

   (m) $2x(x^4 y^2)^3$

   (n) $\frac{n^{-3}(n^4)^2}{3m^{-2}n}$

   (o) $\left(\frac{2q^3 p^3 r^4 \cdot 2p^4}{(qrp^3)^2}\right)^4$

   (p) $\left(\frac{4s^{-3}t^{-4}}{s \cdot s^2 t^{-3}}\right)^{-2}$

   (q) $\frac{n^{-3}(n^4)^2}{3m^{-2}n}$

   (r) $(3a^4 b^-6)(2a^2 b^{-2})^2$

   (s) $\left(\frac{3m^{-5}n^2}{4m^{-2}n^0}\right)^2 \cdot \left(\frac{mn^4}{9n}\right)^2$

2. A byte is a unit used to measure a computer's memory. The numbers of bytes in several units of measure are as follows.

   - kilobyte - 2^{10} bytes

   - megabyte - 2^{10} bytes

   - gigabyte - 2^{30} bytes

   - terabyte - 2^{40} bytes

   (a) How many kilobytes are in 1 terabyte?

   (b) How many megabytes are in 16 gigabytes?

   (c) Another unit used to measure a computer's memory is a bit. There are 8 bits in a byte. How can you convert the number of bytes in each unit of measure given in the table to bits? Can you still use a base of 2? Explain.

Critical Thinking

1. Can you use the Product of Powers Property to multiply $52 \cdot 64$? Explain.