

**I. Simplify each expression. You MUST SHOW WORK for credit b/c these involve many steps!**

1.)  $(4m^{-4}n^{-3})^2(2^{-1}m^3n^{-3})^2$

2.)  $3(2a^4b^{-2})^4(2a^{-5}b^3)^{-1}$

3.)  $(4x^{-1}y^6z^0)^{-2}(3^{-2}x^7y^{-4}z^3)^3$

4.)  $\frac{(3a^{-2}b^{-3})^2(7ab)}{(-3a^{-2}b)^3(-2a^{-1}b^{-1})^3}$

5.)  $\left(\frac{2c^6d^8c^{-8}}{4c^4d^{-1}}\right)^3 \cdot \left(\frac{3c^5d^2}{2c^{-2}d^{-3}}\right)^{-2}$

6.)  $\left(\frac{(a^2b^5)^{-2}(2a^3b)^2}{a^3b^5 \cdot 2a^2}\right)^{-4}$

**II. Evaluate given  $x = -3$ ,  $y = 2$ ,  $z = -2$ .**

7.)  $\left(\frac{4x^3y^{-4}}{x^4z^{-2}}\right)^2$

8.)  $\frac{(3x^{-2}y^{-3})^{-1}}{(2x^3z)(3y^{-5}z^4)}$