Unit 3 – Review #1

A. Complete without a calculator

1. Simplify each expression in the form of a single power. Do not evaluate.

a) $2^4 \times 2^3$ b) $2^6 \div 2^2 \times 2^5$ c) $(2^4)^3$
d) $2^{-3} \div 2^{-5}$ e) $2^{-3} \times 2^6 \div 2$ f) $(2^3)^{-1}$

2. Write the following expressions as a single power. Do not evaluate.

a) $5^3 \div 5^7 \times 5^{10}$ b) $(-4)^0 \times (-4)^5 \times (-4)^{10}$ c) $\frac{(-3)^3 \times (-3)^7}{(-3)^5}$

3. Evaluate each expression.

a) 3^{-2} b) 5^0 c) 2^{-3} d) $(-2)^{-4}$
e) $(2^{-1})^2$ f) $-(-3)^0$ g) $\frac{1}{5^{-2}}$ h) $-(2^3)^{-2}$
i) $\left(\frac{1}{5}\right)^{-3}$ j) $\left(\frac{4}{3}\right)^{-2}$

4. Simplify each expression

a) $x^4 \times x^3$ b) $c^4 \times c^3 \times c$ c) $(m^6)(m^3)$ d) $(x^3)(y)(2y^2)(5x^2)$
e) $h^0 \div t^{-5}$ f) $\frac{m^{-4}}{m^{-6}}$ g) $\left(\frac{x^2}{5y}\right)^3$ h) $\left(\frac{xy^2}{x^3y^{-4}}\right)^0$

5. Write in radical form.

a) $2^{\frac{1}{3}}$ b) $7^{\frac{3}{2}}$ c) $x^{\frac{1}{2}}$ d) $2x^{\frac{3}{4}}$
e) $9^{-\frac{2}{3}}$ f) $-5^{\frac{5}{3}}$ g) $(-5)^{\frac{7}{3}}$ h) $3x^{-\frac{1}{2}}$

6. Write in exponential form.

a) $\sqrt[3]{4}$ b) $\sqrt[7]{2^4}$ c) $\sqrt[5]{-3}$ d) $-\sqrt[4]{x^3}$
e) $\left(\sqrt[3]{2m}\right)^5$ f) $\sqrt[3]{(3p)^5}$

B. Complete using a calculator. Show your work.

7. Write the following expressions as a single power, and then evaluate them.

a) $(-10)^2 \times (-10)^6 \div (-10)^3$ b) $5^6 \div 5^8 \times 5$ c) $\frac{2^6 \times 2^5}{2^9}$

8. Simplifies and evaluates the following expressions.

a) $\frac{10^7}{10^3} - 10^3$ b) $(4^3 \div 4)^2 + (5^2 \times 5^3)^2$ c) $(2^2)^4 + (2^{-4} \div 2^3)^{-2}$
d) $(2 \times 7)^3 - (3^2)^3$ e) $4^{-1} + 3^{-3}$ f) $2^{-2} + 5^{-1}$
g) $4^5 \div 4^2 - 3^5$ h) $3^0 - 2^2 \div 2^4$

9. Identify the missing value of the exponent.

a) $\frac{m^?}{m^2} = m^7$ b) $y^{-3} \times y^? = y^4$ c) $\frac{p^3 p^?}{p^4} = p^7$ d) $n^? \div n^5 = 1$

10. Simplify each expression.

a) $(-2x^2y^3)(-5xy^5)$ b) $(-2a^4b^3)^2$ c) $\left(\frac{3m^2}{2n^2}\right)^3$
d) $\frac{(4xy^2)^2}{(2x^3y^3)^3}$ e) $\left(\frac{6p^2q^3}{3p^4q^5}\right)^{-2}$ f) $\frac{2}{(2xy^6)^{-2}}$
g) $(3m^{-2}n^3)^{-3}$ h) $\frac{(-2s^{-2}t^3)(5s^3t^{-4})}{(4s^5t^{-3})}$ i) $\left(\frac{6a^{-2}b^{-3}}{2a^2b^{-1}}\right)^{-2}$

11. Simplify each expression. Write each power with a positive exponent.

a) $x^{\frac{1}{2}} \cdot x^{\frac{2}{3}}$ b) $\frac{m^{4/5}}{m^{3/2}}$ c) $\left(p^2 q^{1/3}\right)^{2/3}$ d) $\left(p^{\frac{2}{3}} q^{\frac{4}{5}}\right)^{-2}$

12. Evaluate each expression.

a) $4^{\frac{3}{2}}$ b) $25^{0.5}$ c) $16^{-\frac{1}{2}}$ d) $\frac{(6^4+4^6)^0}{3^{-1}}$
e) $\frac{1}{36^{-\frac{3}{2}}}$ f) $8^{\frac{2}{3}}$ g) $\left(\frac{27}{8}\right)^{-\frac{1}{3}}$ h) $\frac{38}{a^0+b^0}$