**Summary of Exponent Laws**

**Recall: Grade 9/10 Exponent Laws**

Product Law: $a^{m}•a^{n}=a^{m+n}$

Quotient Law: $\frac{a^{m}}{a^{n}}=a^{m-n}$

Power of a Power Law: $(a^{m})^{n}=a^{mn}$

Power of a Product Law: $(ab)^{m}=a^{m}b^{m}$

Power of a Quotient Law: $\left(\frac{a}{b}\right)^{m}=\frac{a^{m}}{b^{m}}$

Zero Exponent Law: $a^{0}=1$

Negative Exponent Law: $a^{-m}=\frac{1}{a^{m}}$ or $\left(\frac{a}{b}\right)^{-m}=\left(\frac{b}{a}\right)^{m}$

**Exponent Law Practice**

Expand and simplify the following expressions.

a) $4^{-3}$ b) $2.53^{-5}∙2.53^{5}$ c) $x^{3}y^{5}∙x^{2}y^{-2}$

d) $\frac{y^{8}}{y^{6}}$ e) $\left(\frac{2}{3}\right)^{-3}$ f) $(x^{2}y)^{3}$

g) $\frac{x^{2}y^{-4}z^{-2}}{p^{-1}q^{3}}$ h) $(-3x)^{4}$ i) $\frac{1}{2^{-4}}$

j) $-2^{4}$ k) $(-2)^{4}$ l) $-1.53^{0}$

m) $x^{2}∙x^{4}$ n) $\frac{x^{2}}{x^{5}}$ o) $(-x)^{2}$

p) $\left(\frac{3}{y}\right)^{2}$ q) $(x^{3})^{5}$ r) $3^{-4}$

s) $\frac{x^{3}}{x^{3}}$ t) $\left(-\frac{2x}{3}\right)^{-2}$ u) $5^{\frac{5}{3}}∙5^{\frac{1}{3}}$

Homework: pg 212 # 1-4(ac), 7- 8ac, pg 221 # 1-3, 4-9ac, 11ac, 13gh