KEY

MATH 10 **Grade 9 Review**

1. Use the exponent laws to rewrite each expression as a single power.

a) $(x^3)(x^5) = x^{3+5} = \boxed{x^8}$

b) $\frac{y^8}{y^2} = y^{8-2} = \boxed{y^6}$

c) $\frac{(b^5)(b)}{b^2} = \frac{b^{5+1}}{b^2} = \frac{b^6}{b^2} = b^{6-2} = \boxed{b^4}$

2. Use the exponent laws to rewrite each expression as a single power.

a) $(x^5)^2 = x^{5\times2} = \boxed{x^{10}}$

b) $\frac{y^7}{(y^2)^3} = \frac{y^7}{y^{2\times3}} = \frac{y^7}{y^6} = y^{7-6} = y^1 = \boxed{y}$

c) $(b^2)^3 (b^4)^4 = (b^{2\times3})(b^{4\times4}) = (b^6)(b^{16}) = b^{6+16} = \boxed{b^{22}}$

3. Simplify each expression.

a) $(2x^3)^2 = 2^2 \cdot x^{3\times2} = \boxed{4x^6}$

b) $(4y^2)^3 = 4^3 \cdot y^{2\times3} = \boxed{64y^6}$

c) $(3x^6y^5)^2 = 3^2 \cdot x^{6\times2} \cdot y^{5\times2} = \boxed{9x^{12}y^{10}}$

4. Evaluate.

a) $\left(\frac{1}{2}\right)^4 \cdot \frac{1^4}{2^4} = \boxed{\frac{1}{16}}$

b) $5 \div \frac{2}{3} = \frac{5}{1} \times \frac{3}{2} = \boxed{\frac{15}{2}}$

c) $\frac{3^{25}}{(-3^4)^5} = \frac{3^{25}}{(-1)^5(3^{4\times5})} = \frac{3^{25}}{(-1)(3^{20})} = (-1)\frac{3^{25}}{3^{20}} = -3^{25-20} = \boxed{-3^5}$

5. What is the missing number?

a) $2^{\boxed{5}} = 32$

$2^1 = 2$
$2^2 = 4$
$2^3 = 8$
$2^4 = 16$
$2^5 = 32$

b) $\left(\frac{1}{2}\right)^{\boxed{4}} = \frac{1}{16} \Rightarrow \frac{1^4}{2^4} = \frac{1}{16} = \left(\frac{1}{2}\right)^4$

$16 = 2^4$

c) $(-3)^{\boxed{4}} = 81$

d) $\left(\frac{1}{3}\right)^{\boxed{3}} = \frac{1}{27}$

$3^1 = 3$
$3^2 = 9$
$3^3 = 27$
$3^4 = 81$