



Tutoring Sheet #1

Unit 05a : Mathematics 1

1. Simplify each of the following. Leave answers with exponents:

a. $3^8 \times 3^3$

b. $(-3)^5 \times 3^4$

c. $(2x)^5 \times (2x)^6$

d. $(2xy^2z^3)^4$

e. $\frac{-12x^3y^2z^5}{6x^2y^2z^6}$

f. $3\sqrt{y} \times 5\sqrt{y}$

g. $\sqrt[3]{x^2y^3}$

h. $\frac{5}{\sqrt{5}}$

i. $\left(\frac{ab^2}{a+b}\right)^0$

j. $\frac{x^4 \times x^{-3}}{(x^{-2})^{-3}}$

2. Add or subtract as indicated :

a. $3x^2 + 2x^2 - 5x - (-4x^3 - x^2 + 8x)$

b. $3y^3 + 9y^2 - 11y + 8 - (-4y^2 + 10y - 6)$

c. $6x - x^2 + 16y - 2y^2 - 0.5x^2 - 0.5y^2 - xy$

3. Perform each of the following operations:

a. $x(13-2x-y) + y(13-x-2y)$

b. $(3x+5)(4x^2-2x-1)$

c. $(3x-1)^2$

d. $(x-2)(2x+3)^2$

e. $x(x-4)^3$

f. $(2p-5q)(2p+5q)$

4. Factor as completely as possible :

a. $2xy^2 - 4xy + 5x$

b. $x^2 - 6x + 5$

c. $3x^4 + 13x^3 + 4x^2$

d. $10x^2 - 11x + 3$

e. $4x^2 - 20x + 25$

f. $81p^2 - 25q^2$

g. $8p^3 - 1$

h. $125p^3 + 216$

5. Perform each operation :

a. $\frac{4x}{5} \times \frac{35x}{12}$

b. $\frac{5x^2}{24} - \frac{75x}{36}$

c. $\frac{6}{15x} + \frac{2}{3x} - \frac{9}{10x}$

d. $\frac{x^2 - 3x + 2}{2x(x-1)} \div \frac{x-2}{8x}$

e. $\frac{2x-10}{5x} - \frac{20x-25}{12}$

f. $\frac{5}{x-2} - \frac{4}{x}$

6. a. Simplify : i. $\sqrt[3]{54p^3q^5}$ ii. $3^{-2} + 3^{-1}$ iii. $\sqrt[5]{-32}$ iv. $\frac{\sqrt{2}}{1+\sqrt{3}}$

v. $((2\sqrt{5} - \sqrt{3})(\sqrt{5} + 2\sqrt{3}))$

vi. $p^{\frac{2}{3}} \left(2p^{\frac{1}{3}} + 5p \right)$

b. Estimate each of the following : $5\sqrt{7}$, $\sqrt{22} + 3$, $\sqrt{40}$, $\sqrt{93}$, $\sqrt{897}$