



Tutoring Sheet-Basics #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. 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. $p^{\frac{2}{3}} \left(2p^{\frac{1}{3}} + 5p \right)$