Pakistan School
Kingdom of Bahrain

Welcome Class 10th (arts)

Algebraic Formulas and Applications

Objectives

Students will be able to:

Simplify the given algebraic expression using formula

Formulas

$$(a+b+c)^2 = a^2 + b^2 + c^2 + 2ab + 2bc + 2ca$$

$$(a+b)^3 = a^2 + 3ab(a+b) + b^2$$

$$(a-b)^3 = a^2 - 3ab(a-b) - b^2$$

$$a^3 + b^3 = (a+b)(a^2 - ab + b^2)$$

$$a^3 - b^3 = (a-b)(a^2 + ab + b^2)$$

5. $\left(ab-\frac{1}{ab}\right)^3$

Solution: $\left(ab-\frac{1}{ab}\right)^3$

$$=(ab)^3-\left(\frac{1}{ab}\right)^3-3(ab)\left(\frac{1}{ab}\right)\left(ab-\frac{1}{ab}\right)$$

$$=a^3b^3-\frac{1}{a^3b^3}-3\left(ab-\frac{1}{ab}\right)$$

7 $(2p + q)^3$

Solution: $(2p + q)^3$

$$= (2p)^3 + (q)^3 + 3(2p)(q)(2p+q)$$

$$= 8p^3 + q^3 + 6pq(2p+q)$$

$$= 8p^3 + q^3 + 12p^2q + 6pq^2$$

$$= 8p^3 + 12p^2q + 6pq^2 + q^3$$

8 $(3p + q + r)^2$

Solution: $(3p + q + r)^2$

$$= (3p)^2 + (q)^2 + (r)^2 + 2(3p)(q) + 2(q)(r) + 2(r)(3p)$$

$$= 9p^2 + q^2 + r^2 + 6pq + 2qr + 6rp$$

10 $(x+y)^3-1$

Solution: $(x+y)^3-1$

$$=(x+y)^3-(1)^3$$

$$=(x+y-1)\left[(x+y)^2+(1)^2+(x+y)(1)\right]$$

$$=(x+y-1)\left[x^2+y^2+2xy+1+x+y\right]$$

$$=(x+y-1)\left(x^2+y^2+2xy+x+y+1\right)$$

Activity

Simplify using formula

$(2x + 3y)^3$

Solution

9 $(2x + 3y)^3$

Solution: $(2x + 3y)^3$

$$= (2x)^3 + (3y)^3 + 3(2x)(3y)(2x + 3y)$$

$$= 8x^3 + 27y^3 + 18xy(2x + 3y)$$

$$= 8x^3 + 27y^3 + 36x^2y + 54xy^2$$

Homework

Ex 1.2 remaining parts