

# Mathematics

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(Chapter – 2) (Polynomials)(Exemplar Problems)

(Class – IX)

## Exercise 2.3

### Question 28:

Expand the following:

(i)  $(4a - b + 2c)^2$

(ii)  $(3a - 5b - c)^2$

(iii)  $(-x + 2y - 3z)^2$

### Answer 28:

(i). Given that:  $(4a - b + 2c)^2$

$$= (4a)^2 + (-b)^2 + (2c)^2 + 2(4a)(-b) + 2(-b)(2c) + 2(2c)(4a)$$

$$[\because (a + b + c)^2 = a^2 + b^2 + c^2 + 2ab + 2bc + 2ca]$$

$$= 16a^2 + b^2 + 4c^2 - 8ab - 4bc + 16ca$$

(ii). Given that:  $(3a - 5b - c)^2$

$$= (3a)^2 + (-5b)^2 + (-c)^2 + 2(3a)(-5b) + 2(-5b)(-c) + 2(-c)(3a)$$

$$[\because (a + b + c)^2 = a^2 + b^2 + c^2 + 2ab + 2bc + 2ca]$$

$$= 9a^2 + 25b^2 + c^2 - 30ab + 10bc - 6ca$$

(iii). Given that:  $(-x + 2y - 3z)^2$

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

$$[\because (a + b + c)^2 = a^2 + b^2 + c^2 + 2ab + 2bc + 2ca]$$

$$= x^2 + y^2 + 9z^2 - 4xy - 12yz + 6zx$$

