



NCERT Solutions For Class 7 Maths Algebraic Expressions Exercise
12.3

Q1. If $m = 2$, find the value of:

(i) $m - 2$ (ii) $3m - 5$ (iii) $9 - 5m$

(iv) $3m^2 - 2m - 7$ (v) $\frac{5m}{2} - 4$

Ans:

(i) $m - 2 = 2 - 2 = 0$

(ii) $3m - 5 = (3 \times 2) - 5 = 6 - 5 = 1$

(iii) $9 - 5m = 9 - (5 \times 2) = 9 - 10 = -1$

(iv) $3m^2 - 2m - 7 = 3 \times (2 \times 2) - (2 \times 2) - 7$
 $= 12 - 4 - 7 = 1$

(v) $\frac{5m}{2} - 4 = \left(\frac{5 \times 2}{2}\right) - 4 = 1$

Q2. If $p = -2$, find the value of:

(i) $4p + 7$

(ii) $-3p^2 + 4p + 7$

(iii) $-2p^3 - 3p^2 + 4p + 7$

Ans:

(i) $4p + 7 = 4 \times (-2) + 7 = -8 + 7 = -1$

(ii) $-3p^2 + 4p + 7 = -3(-2) \times (-2) + 4 \times (-2) + 7$
 $= -12 - 8 + 7 = -13$

(iii) $-2p^3 - 3p^2 + 4p + 7$
 $= -2(-2) \times (-2) \times (-2) - 3(-2) \times (-2) + 4 \times (-2) + 7$
 $= 16 - 12 - 8 + 7 = 3$

Q3. Find the value of the following expressions, when $x = -1$:

(i) $2x - 7$ (ii) $-x + 2$ (iii) $x^2 + 2x + 1$

(iv) $2x^2 - x - 2$

Ans:

(i) $2x - 7$

$= 2 \times (-1) - 7 = -9$

(ii) $-x + 2 = -(-1) + 2 = 1 + 2 = 3$

(iii) $x^2 + 2x + 1 = (-1) \times (-1) + 2 \times (-1) + 1$

$$= 1 - 2 + 1 = 0$$

$$(iv) 2x^2 - x - 2 = 2(-1) \times (-1) - (-1) - 2$$

$$= 2 + 1 - 2 = 1$$

Q4. If $a = 2$, $b = -2$, find the value of:

$$(i) a^2 + b^2 \quad (ii) a^2 + ab + b^2 \quad (iii) a^2 - b^2$$

Ans:

$$(i) a^2 + b^2$$

$$= (2)^2 + (-2)^2 = 4 + 4 = 8$$

$$(ii) a^2 + ab + b^2$$

$$= (2 \times 2) + 2 \times (-2) + (-2) \times (-2)$$

$$= 4 - 4 + 4 = 4$$

$$(iii) a^2 - b^2$$

$$= (2)^2 - (-2)^2 = 4 - 4 = 0$$

Q5. When $a = 0$, $b = -1$, find the value of the given expressions:

$$(i) 2a + 2b \quad (ii) 2a^2 + b^2 + 1$$

$$(iii) 2a^2b + 2ab^2 + ab \quad (iv) a^2 + ab + 2$$

Ans:

$$(i) 2a + 2b = 2 \times (0) + 2 \times (-1) = 0 - 2 = -2$$

$$(ii) 2a^2 + b^2 + 1$$

$$= 2 \times (0)^2 + (-1) \times (-1) + 1$$

$$= 0 + 1 + 1 = 2$$

$$(iii) 2a^2b + 2ab^2 + ab$$

$$= 2 \times (0)^2 \times (-1) + 2 \times (0) \times (-1) \times (-1) + 0 \times (-1)$$

$$= 0 + 0 + 0 = 0$$

$$(iv) a^2 + ab + 2$$

$$= (0)^2 + 0 \times (-1) + 2$$

$$= 0 + 0 + 2 = 2$$

Q6. Simplify the expressions and find the value if x is equal to 2

$$(i) x + 7 + 4(x - 5) \quad (ii) 3(x + 2) + 5x - 7$$

$$(iii) 6x + 5(x - 2) \quad (iv) 4(2x - 1) + 3x + 11$$

$$(iii) \ 5x + 3(x - 2) \quad (iv) \ 4(2x - 1) + 3x + 11$$

Ans:

$$\begin{aligned} \text{(i)} \quad x + 7 + 4(x - 5) &= x + 7 + 4x - 20 \\ &= x + 4x + 7 - 20 \\ &= 5x - 13 \end{aligned}$$

$$= (5 \times 2) - 13$$

$$= 10 - 13 = -3$$

$$\begin{aligned} \text{(ii)} \quad 3(x + 2) + 5x - 7 &= 3x + 6 + 5x - 7 \\ &= 3x + 5x + 6 - 7 = 8x - 1 \\ &= (8 \times 2) - 1 = 16 - 1 = 15 \end{aligned}$$

$$\begin{aligned} \text{(iii)} \quad 6x + 5(x - 2) &= 6x + 5x - 10 \\ &= 11x - 10 \end{aligned}$$

$$= (11 \times 2) - 10 = 22 - 10 = 12$$

$$\begin{aligned} \text{(iv)} \quad 4(2x - 1) + 3x + 11 &= 8x - 4 + 3x + 11 \\ &= 11x + 7 \\ &= (11 \times 2) + 7 \\ &= 22 + 7 = 29 \end{aligned}$$

Q7. Simplify these expressions and find their values if $x = 3$, $a = -1$, $b = -2$.

$$\text{(i)} \quad 3x - 5 - x + 9 \quad \text{(ii)} \quad 2 - 8x + 4x + 4$$

$$\text{(iii)} \quad 3a + 5 - 8a + 1 \quad \text{(iv)} \quad 10 - 3b - 4 - 5b$$

$$\text{(v)} \quad 2a - 2b - 4 - 5 + a$$

Ans:

$$\begin{aligned} \text{(i)} \quad 3x - 5 - x + 9 &= 3x - x - 5 + 9 \\ &= 2x + 4 = (2 \times 3) + 4 = 10 \end{aligned}$$

$$\begin{aligned} \text{(ii)} \quad 2 - 8x + 4x + 4 &= 2 + 4 - 8x + 4x \\ &= 6 - 4x = 6 - (4 \times 3) = 6 - 12 = -6 \end{aligned}$$

$$\begin{aligned} \text{(iii)} \quad 3a + 5 - 8a + 1 &= 3a - 8a + 5 + 1 \\ &= -5a + 6 = -5 \times (-1) + 6 \\ &= 5 + 6 = 11 \end{aligned}$$

$$\begin{aligned} \text{(iv)} \quad 10 - 3b - 4 - 5b &= 10 - 4 - 3b - 5b \\ &= 6 - 8b = 6 - 8 \times (-2) \\ &= 6 + 16 = 22 \end{aligned}$$

$$\begin{aligned}
 \text{(v)} \quad & 2a - 2b - 4 - 5 + a = 2a + a - 2b - 4 - 5 \\
 & = 3a - 2b - 9 \\
 & = 3 \times (-1) - 2(-2) - 9 \\
 & = -3 + 4 - 9 = -8
 \end{aligned}$$

Q8. (i) If $z = 10$, find the value of $z^3 - 3(z - 10)$.

(ii) If $p = -10$, find the value of $p^2 - 2p - 100$

Ans:

$$\begin{aligned}
 \text{(i)} \quad & z^3 - 3(z - 10) = z^3 - 3z + 30 \\
 & = (10 \times 10 \times 10) - (3 \times 10) + 30 \\
 & = 1000 - 30 + 30 = 1000
 \end{aligned}$$

$$\begin{aligned}
 \text{(ii)} \quad & p^2 - 2p - 100 \\
 & = (-10) \times (-10) - 2(-10) - 100 \\
 & = 100 + 20 - 100 = 20
 \end{aligned}$$

Q9. What should be the value of a if the value of $2x^2 + x - a$ equals to 5, when $x = 0$?

Ans:

$$\begin{aligned}
 & 2x^2 + x - a = 5, \text{ when } x = 0 \\
 & (2 \times 0) + 0 - a = 5 \\
 & 0 - a = 5 \\
 & a = -5
 \end{aligned}$$

Q10. Simplify the expression and find its value when $a = 5$ and $b = -3$.

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

Ans:

$$\begin{aligned}
 & 2(a^2 + ab) + 3 - ab = 2a^2 + 2ab + 3 - ab \\
 & = 2a^2 + 2ab - ab + 3 \\
 & = 2a^2 + ab + 3 \\
 & = 2 \times (5 \times 5) + 5 \times (-3) + 3 \\
 & = 50 - 15 + 3 = 38
 \end{aligned}$$

***** END *****

