Work sheet- 3 for class- Ten
Chapter- Three
Algebraic Expression
Exercise- 3.1

Creative Multiplication Choice Questions

1. If $x + y = 2$ and $xy = 1$ then what is the value of $(x - y)^2$? [R.B.- 20]

a) 0 b) 2
c) 6 d) 8

2. If $p^2 = 13 + \sqrt{168}$ then which one is the value of $\frac{1}{p}$? [Dj.B.- 20]

a) $\sqrt{13} + 42$ b) $\sqrt{7} + \sqrt{6}$
c) $\sqrt{13} - 42$ d) $\sqrt{7} - \sqrt{6}$

3. If $x^2 - 8 = 2\sqrt{15}$ then what is the value of x? [C.B.- 20]

a) $\sqrt{3} + 5$ b) $3 + \sqrt{5}$
c) $\sqrt{5} + \sqrt{3}$ d) $\sqrt{5} - \sqrt{3}$

4. If $a + b = \sqrt{3}$ and $a - b = \sqrt{2}$ then what is the value of ab? [Ctg.B.- 20]

a) $\frac{1}{4}$ b) $\frac{1}{2}$
c) 1 d) $\frac{5}{4}$

5. If $p + \frac{1}{p} = 0$ then what is the value of $\sqrt{2}(\sqrt{p} + \frac{1}{\sqrt{p}})$? [Ctg.B.- 20]

a) 0 b) 1
c) 2 d) 4

6. If $x = 2 + \sqrt{3}$ then $\frac{1}{x}$ = What? [S.B.- 20]

a) 1 b) $\frac{1}{2-\sqrt{3}}$
c) $2-\sqrt{3}$ d) $7 - 4\sqrt{3}$

7. If p and q is an integer, minimum what must be added to $p^2 + q^2$ so that the sum is a perfect square? [S.B.- 20]

a) $-2pq$ b) $-pq$
c) Pq d) 4pq

8. If $x = \sqrt{3} + \sqrt{5}$ then what is the value of $\frac{1}{x}$? [B.B.- 20]

a) $\frac{1}{2}(\sqrt{5} - \sqrt{3})$ b) $\sqrt{3} - \sqrt{5}$
c) $\sqrt{5} - \sqrt{3}$ d) $\frac{1}{2}(\sqrt{3} - \sqrt{5})$

9. If $a = \sqrt{5}$ and $b = \sqrt{3}$ then what is the value of $(a + b)^2 - 2ab$? [D.B.- 19]

a) 2 b) $\sqrt{15}$
c) $2\sqrt{15}$ d) 8

10. If $a + b = \sqrt{5}$ and $a - b = \sqrt{3}$ then $a^2 + b^2$ = What?

a) 2 b) 4
c) 8 d) 64

11. Minimum what must be added to $9x^2 + 30x$ so that the sum is a perfect square? [R.B.- 19]

a) 100 b) 64
c) 36 d) 25

12. If $a + b = \sqrt{16}$ and $ab = 1$ then $(a - b)^2$ = What? [R.B.- 19]

a) 12 b) 14
c) 18 d) 20

13. If $x = 3 - \sqrt{8}$ then what is the value of $\frac{1}{x}$? [S.B.- 19]

a) $9 - \sqrt{8}$ b) $3 + \sqrt{8}$
c) $\frac{1}{3+\sqrt{8}}$ d) $\frac{1}{9-\sqrt{8}}$

14. If $2x - \frac{1}{3x} = 2$ then what is the value of $3x - \frac{1}{2x}$? [B.B.- 19]

a) $\frac{2}{3}$ b) 1
c) $\frac{3}{2}$ d) 3

15. If $x + \frac{1}{x} = 1$ then- [R.B.- 19]

i. $(x + \frac{1}{x})^2 = 1$
ii. $(x - \frac{1}{x})^2 = -3$
iii. $x^2 + \frac{1}{x^2} = -1$

Which of the following is correct?

a) i and ii b) i and iii
c) ii and iii d) i, ii and iii

16. If $p^2 - 2p + 1 = 0$ then- [Dj.B.- 19]

i. Co-efficient of p is – 2.
ii. $p + \frac{1}{p} = 2$.
iii. The value of $p - \frac{1}{p}$ is 0.

Which of the following is correct?

a) i and ii b) i and iii
c) ii and iii d) i, ii and iii

17. If $p + q = \sqrt{3}$ and $p - q = \sqrt{2}$.

Mithun Kumar

[C.B.- 19]

i. $p = \frac{\sqrt{3}+\sqrt{2}}{2}$

ii. $p^2 - q^2 = 6$

iii. $pq = \frac{1}{4}$

Which of the following is correct?

a) i and ii b) i and iii
c) ii and iii d) i, ii and iii

Answer to the questions (18 - 19) using the following information:

$x = 7 + 4\sqrt{3}$.

18. What is the value of $x^2 + \frac{1}{x^2}$? [C.B.- 19]

a) 190 b) 194
c) 198 d) 200

19. What is the value of $\sqrt{x} - \frac{1}{\sqrt{x}}$? [C.B.- 19]

a) $2\sqrt{3}$ b) 4
c) $8\sqrt{3}$ d) 14

Answer to the questions (12 - 13) using the following information

$a^2 - 4a - 1 = 0$.

20. What is the value of $a^2 + \frac{1}{a^2}$? [Ctg.B.- 19]

a) 12 b) 14
c) 18 d) 20

21. What is the value of $a + \frac{1}{a}$ when $a > 0$ [Ctg.B.- l9]

a) $2\sqrt{3}$ b) $\sqrt{14}$
c) $3\sqrt{2}$ d) $2\sqrt{5}$

Answer to the questions (21 - 22) using the following information:

$p - \frac{1}{p} = 7$.

22. $\left(P + \frac{1}{p}\right)^2$ = What? [J.B.- 19]

a) 53 b) 51
c) 47 d) 45

23. What is the value of $\frac{p}{p^2 - 6p - 1}$? [J.B.- l9]

a) $\frac{1}{12}$ b) $\frac{1}{2}$
c) 1 d) 12

According to the following condition answer the questions (24 – 25):

$x + y = \sqrt{10}$ and $x - y = \sqrt{6}$.

24. What is the value of xy? [S.B.- 19]

a) 1 b) 2
c) 4 d) 8

25. Which is the value of $x^2 + y^2$? [S.B.-19]

a) 16 b) 8
c) 4 d) 2

26. $a^2 - 5a - 1 = 0$ What is the value of $a^2 + \frac{1}{a^2}$? [All B.-18]

a) 23 b) 25
c) 27 d) 29

27. If $a = \sqrt{2}$ and $b = \sqrt{3}$ then what is the value of $(a + b)^2 - 2ab$? [Dj.B.- 17]

a) 1 b) 2
c) 3 d) 5

28. If $(x^2 + 1)^2 = 5x^2$ then what is the value of $x + \frac{1}{x}$? [C.B.- 17]

a) $\sqrt{5}$ b) $2\sqrt{5}$
c) 5 d) $5\sqrt{5}$

29. If $p + q = 5$ and $p - q = 3$ then what is the value of $p^2 + q^2$? [S.B.- 17]

a) 34 b) 19
c) 17 d) 8

30. How many values can satisfy an identity? [B.B.- 17]

a) 1 b) 2
c) 0 d) Innumerable

31. If x - y = 2 and xy = 24 then what is the value of (x + y)? [R.B.- 16]

a) 10 b) 52
c) 100 d) −92

32. If $b + \frac{2}{b} = 3$ which one of the following is the value of $\left(b - \frac{2}{b}\right)^2$? [Dj.B.- 16]

a) 9 b) 5
c) 3 d) 1

33. If $h + \frac{1}{h} = 6$ and $h - \frac{1}{h}$ = What? [Ctg.B.- 16]

a) $4\sqrt{2}$ b) $2\sqrt{10}$
c) 34 d) 38

34. If $p + q = \sqrt{5}$ and $p - q = \sqrt{3}$ then what is the value of $p^2 + q^2$? [S.B.- 16]

a) 0 b) 1

Mithun Kumar

c) 2 d) 4

35. Which one of the following is the square (- 2x - 3y)? [B.B.- 16]

a) $-4x^2 - 12xy - 9y^2$
b) $2x^2 + 12xy + 9y^2$
c) $4x^2 - 12xy + 9y^2$
d) $4x^2 + 12xy + 9y^2$

36. $\frac{1}{2}\{(2x + 3y)^2 + (2x - 3y)^2\}$ = What? [B.B.- 16]

a) $4x^2 + 9y^2$ b) $2(4x^2 + 9y^2)$
c) 12xy d) 24xy

37. If $x + \frac{1}{x} = 5$ then- [Dj.B.- 17]

i. $\left(x - \frac{1}{x}\right)^2 = 21.$
ii. $x^2 - 5x + 1 = 0.$
iii. $x^2 + \frac{1}{x^2} = 23.$

Which one of the following is correct?

a) i and ii b) i and iii
c) ii and iii d) i, ii and iii

38. If $x(2x - 3) = \frac{1}{2}$ then- [C.B.- 17]

i. $4x^2 - \frac{1}{4x^2} = 3\sqrt{13}.$
ii. $\left(2x + \frac{1}{2x}\right)^2 = 13.$
iii. $4x^2 + \frac{1}{4x^2} = 11.$

Which one of the following is correct?

a) i and ii b) i and iii
c) ii and iii d) i, ii and iii

Answer the questions No. (39 – 40) according to the following information: $x = 3 + 2\sqrt{2}$.

39. What is the value of $+\frac{1}{x}$? [S.B.- 17]

a) 6 b) $4\sqrt{2}$
c) $2\sqrt{2}$ d) 0

40. What is the value of $x^2 + \frac{1}{x^2}$? [S.B.- 17]

a) 28 b) 30
c) 32 d) 34

41. Identity - [C.B.- 17]

i. All algebraic formulae are identities.
ii. All identities are equations.
iii. All equations are identities.

Which one of the following is correct?

a) i and ii b) i and iii
c) ii and iii d) i, ii and iii

42. If a + b = 4 and a - b = 2 then- [Ctg.B.- 16]

i. $a^2 - b^2 = 7$
ii. $a^2 + b^2 = 10$
iii. $ab = a$

Which one of the following is correct?

a) i and ii b) i and iii
c) ii and iii d) i, ii and iii

43. If $(x - 3)^2 = x^2 - 6x + 9$ then- [J.B.- 16]

i. An identity.
ii. An equation.
iii. Satisfied for all the values of x.

Which one of the following is correct?

a) i and ii b) i and iii
c) ii and iii d) i, ii and iii

Answer the questions No. (44 – 45) based using the above information: $y = \sqrt{6} + \sqrt{5}$.

44. What is the value of $\frac{1}{y}$? [S.B.- 16]

a) $2(\sqrt{6} - \sqrt{5})$ b) $\sqrt{6} - \sqrt{5}$
c) $2\sqrt{6} + 3\sqrt{5}$ d) $2\sqrt{6} - 3\sqrt{5}$

45. What is the value of y^2? [S.B.- 16]

a) $11 + \sqrt{30}$ b) $11 - \sqrt{30}$
c) $11 + 2\sqrt{30}$ d) $11 - 2\sqrt{30}$

46. If $y^2 + \frac{1}{y^2} = 6$ then what is the value of $\left(y + \frac{1}{y}\right)$? [D.B.- l5]

a) $\pm 2\sqrt{2}$ b) $2\sqrt{2}$
c) ± 2 d) $\pm\sqrt{2}$

47. If $x + y = 8$ and $2y = 10$ then what is the value of x ? [D.B.- l5]

a) -2 b) 2
c) 3 d) 13

48. If $\left(x + \frac{1}{x}\right) = 3$ then what is the value of $x^2 + \frac{1}{x^2}$? [D.B.- l5]

a) 11 b) 8
c) 7 d) 4

49. Which of the following is an identity? [R.B.- 15]

a) $x^2 - 5x + 6$ b) $(a - 4)^2$
c) $(x + a)(x + b) = x^2 + (a + b)x + ab$ d) $(a + b)^2 + (a - b)^2 = a^2 + b^2$

Mithun Kumar

50. If $m + n = 8$ and $mn = 15$ then $(m - n)^2$ = What? **[R.B.- l5]**

a) 2 b) 4
c) 34 d) 94

51. If $a^2 + \frac{1}{a^2} = 2$ then $a + \frac{1}{a}$ = What? **[J.B.- 15]**

a) 0 b) 1
c) 2 d) 4

52. If $p - \frac{1}{p} = 3$ then what is the value of $p^2 + \frac{1}{p^2}$? **[J.B.- l5]**

a) 5 b) 7
c) 11 d) 13

53. If $a + b = 1$ and $ab = 4$ then what is the value of $(a - b)^2$? **[J.B.- l5]**

a) -15 b) -7
c) 9 d) 17

54. If $(a + b - c)^2$ = What? **[C.B.- l5]**

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

55. $a + b = 3$ and $ab = 2$ then what is the value of $a^2 - ab + b^2$? **[S.B.- l5]**

a) 3 b) 5
c) 9 d) 13

56. What is to be added to $25x^2 + 36y^2$ so that their sum will be a perfect square? **[S.B.- l5]**

a) 30 xy b) 45 xy
c) 60 xy d) 70 xy

57. If $a + \frac{1}{a} = \sqrt{2}$ then find the value of $a^2 + \frac{1}{a^2}$? **[Dj.B.- l5]**

a) -2 b) 0
c) 4 d) 6

58. Which one of the following is an identity? **[Dj.B.- l5]**

a) $(x + 1)^2 - (x - 1)^2 = 4x$
b) $(x + 1)^2 - (x - 1)^2 = 2(x^2 + 1)$
c) $(x + 1)^2 - (x - 1)^2 = 2xy$
d) $(x + 1)^2 = x^2 + 2xy + y^2$

59. **[C.B.- 15]**

i. $(a + b)^2 = a^2 + 2ab + b^2$
ii. $(a + b)^2 = (a - b)^2 + 4ab$
iii. $(a + b)^4 - (a - b)^4 = 8ab(a^2 + b^2)$.

Which one of the following is correct?

a) i and ii b) i and iii
c) ii and iii d) i, ii and iii

Mithun Kumar

Creative Questions:

1. $P = 3 + 2\sqrt{2}$ **[S.B.- 19]**

a) If f(x) = x^2 – 5x + 2k for which value of k will be f(2) = 0?

b) Find the value of $p^4 - \frac{1}{p^4}$.

c) Prove that, $p\sqrt{p} + \frac{1}{p\sqrt{p}} = 10\sqrt{2}$.

2. $a^4 + a^2b^2 + b^4 = 21$ **and** $a^2 + ab + b^2 = 7$ **where a, b positive and a > b.** **[B.B.- 16]**

a) Find the value of $a^2 - ab + b^2$.

b) Prove that, $8ab(a^2 + b^2) = 80$.

c) Find the value of a and b.

3. **If** $x - \frac{1}{x} = m$ **is an algebraic relation.**

a) Find the value of $x^2 + \frac{1}{x^2}$.

b) Show that, $\frac{x^8 + 1}{x^4} = m^4 + 4m^2 + 2$.

c) If $x^4 = 119 - \frac{1}{x^4}$ then prove that, $m = \pm 3$.

4. **If** $x + y + z = 12$ **and** $x^2 + y^2 + z^2 = 50$ **then -**

a) What is the value of $2(xy + yz + zx)$.

b) Find the value of $(x - y)^2 + (y - z)^2 + (z - x)^2$.

c) Prove that, $(x + y)^2 + (y + z)^2 + (z + x)^2 - 2 = 32\{(x - y)^2 + (y - z)^2 + (z - x)^2\}$.

5. **Given that,** $x = 9 + 4\sqrt{5}$ **then -**

a) Find the value of x is square form.

b) Find the value of $\left(\sqrt{x} - \frac{1}{\sqrt{x}}\right)^2$ when $\sqrt{x}$ is positive.

c) Show that, $x^4 - 322x^2 + 1 = 0$.

6. **If** $x + \frac{1}{x} = 3$ **then -**

a) Resolve into factors: $(a^2 - b^2)(x^2 - y^2) + 4abxy$.

b) Find the value of $\frac{x^6 + 1}{x^3}$.

c) Show that, $47(x^2 + \frac{1}{x^2}) = 7(x^4 + \frac{1}{x^4})$.

7. **If** $p^2 - 1 = 4p$ **then -**

a) Find the value of: $\left(p + \frac{1}{p}\right)^2$.

b) Find the value of $\frac{p^3 + 5p}{p^4 + 4p^2 - 5} \times \sqrt[3]{64}$.

c) Show that $p^4 = 322 - \frac{1}{p^4}$.

8. **If** $x + \frac{1}{x} = 3$ **then -**

a) $\sqrt{x} - \frac{1}{\sqrt{x}}$ = what?

b) What the value of $x^4 + \frac{1}{x^4}$.

c) Show that $\left(\sqrt{x} + \frac{1}{\sqrt{x}}\right)^4 = 25$.

9. $x - \frac{1}{x} = p$ **and** $y^2 = 2y - 1$ **then -**

a) If $a + b = \sqrt{5}$ and $a - b = 2$ then $a^2 - b^2$ = What?

b) Find the value of $\frac{c}{x(x - p)}$.

c) Prove that, $y^2 + \frac{1}{y^2} = y^4 + \frac{1}{y^4}$.

10. $a + b = \sqrt{5}$ **and** $a - b = \sqrt{3}$ **then -**

a) Find the square of $\left(a + \frac{1}{a}\right)$.

b) Prove that, $8ab(a^2 + b^2) = 16$.

c) Find the value of $(a + b)^3 + 6a(a^2 - b^2) + (a - b)^3$.

11. **If** $x + \frac{1}{x} = \sqrt{3}$ **then -**

a) Show that, $x^2 + \frac{1}{x^2} = 1$.

b) Show that, $x^8 + x^4 + 1 = 0$.

c) Find the value of $\frac{x}{x^2 + \sqrt{3}x + 1}$.

Mithun Kumar