EXERCISE # 1

Q.1 Add the following algebraic expressions:

$2,\ \frac{2y}{3} - \frac{5y^2}{3} + \frac{5y^3}{2}, -\frac{4}{3} + \frac{2y^2}{3} - \frac{y}{2},$

$\frac{5y^3}{3} + 3y^2 + 3y + \frac{6}{5}$

Q.2 Subtract : $\left(-2y^2 + \frac{1}{2}y - 3\right)$ from $7y^2 - 2y + 10$.

Q.3 Subtract: $\frac{3}{2}x^2y + \frac{4}{5}y - \frac{1}{3}x^2yz$ from

$\frac{12}{5}x^2yz - \frac{3}{5}xyz + \frac{2}{3}x^2y.$

Q.4 Find the volume of the rectangular boxes with following length, breadth and height :

	Length	Breadth	Height
(i)	2ax	3by	5cz
(ii)	m^2n	n^2p	p^2m
(iii)	2q	$4q^2$	$8q^3$

Q.5 Find each of the following products:

(i) $(-2x^2) \times (7a^2x^7) \times (6a^5x^5)$

(ii) $(4s^2t) \times (3s^3t^3) \times (2st^4) \times (-2)$

Q.6 Multiply $-\frac{4}{3}xy^3$ by $\frac{6}{7}x^2y$ and verify your result for x = 2 and y = 1.

Q.7 Find the product of $-5x^2y, -\frac{2}{3}xy^2z,$

$\frac{8}{15}xyz^2$ and $-\frac{1}{4}$. Verify the result when x = 1, y = 2 and y = q.

Q.8 Find the product of $\frac{7}{2}s^2t$ and s + t. Verify the result for $s = \frac{1}{2}$ and t = 5.

Q.9 Find the following products:

(i) $100x \times (0.01x^4 - 0.01x^2)$

(ii) $121.5ab \times \left(ac + \frac{b}{10}\right)$

(iii) $0.1a \times (0.01a \times 0.001b)$

Q.10 Add:

(i) $5m(3 - m)$ and $6m^2 - 13m$

(ii) $4y(3y^2 + 5y - 7)$ and $2(y^3 - 4y^2 + 5)$

Q.11 (i) Subtract: $3l\,(l - 4m + 5n)$ from $4l\,(10n - 3m + 2l)$

(ii) Subtract : $3a\,(a + b + c) - 2b\,(a + b + c)$ from $4c(-a + b + c)$

Q.12 Multiply $\left(\frac{1}{5}x - \frac{1}{4}y\right)$ and $(5x^2 - 4y^2)$

Q.13 Multiply $(3x^2 + y^2)$ by $(x^2 + 2y^2)$.

Q.14 Multiply: $\{2m + (-n)\}$ by $\{-3m + (-5)\}$

Q.15 Find the product of $\left(y + \frac{2}{7}y^2\right)$ and $(7y - y^2)$ and verify the result for y = 3.

Q.16 Simplify the following:

(i) $\frac{1}{3}(6x^2 + 15y^2)\,(6x^2 - 15y^2)$

(ii) $9x^4(2x^3 - 5x^4) \times 5x^6\,(x^4 - 3x^2)$

Q.17 Multiply: $(2x^2 - 4x + 5)$ by $(x^2 + 3x - 7)$

Q.18 Find the product of the following binomials:

(i) $(6x^2 - 7y^2)\,(6x^2 - 7y^2)$

(ii) $\left(\frac{1}{2}x - \frac{1}{5}y\right)\left(\frac{1}{2}x - \frac{1}{5}y\right)$

Q.19 Find the product of the following binomials:

(i) $\left(\frac{3}{4}x+\frac{5}{6}y\right)\left(\frac{3}{4}x-\frac{5}{6}y\right)$

(ii) $\left(2a+\frac{3}{b}\right)\left(2a-\frac{3}{b}\right)$

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

(iv) $(-a + c)(-a - c)$

Q.20 If $x + \frac{1}{x} = 9$ and $x^2 + \frac{1}{x^2} = 53$, find the value of $x - \frac{1}{x}$.

Q.21 If $x + y = 12$ and $xy = 14$, find the value of $x^2 + y^2$.

Q.22 Simplify the following products:

(i) $(x^2 + x + 1)(x^2 - x + 1)$

(ii) $(x^2 + 2x + 2)(x^2 - 2x + 2)$

Q.23 Simplify the following by using:

$(a + b)(a - b) = a^2 - b^2$.

(i) 68×72 (ii) 101×99

(iii) 67×73 (iv) $128^2 - 77^2$

Q.24 Find the greatest common factor of the monomials $6x^3a^2b^2c$, $8x^2ab^3c^3$ and $12a^3b^2c^2$.

ANSWER KEY

EXERCISE # 1

1. $\frac{28}{15} + \frac{19}{6}y + 2y^2 + \frac{25}{6}y^3$

3. $\frac{41}{15}x^2yz - \frac{5}{6}x^2y - \frac{3}{5}xyz - \frac{4}{5}y$

5. (i) $-84x^{14}a^7$ (ii) $-48s^6t^8$ (iii) $1000x^{14}y^{11}$

6. $-\frac{8}{7}x^3y^4$

7. $-\frac{4}{9}x^4y^4z^4$

9. (i) $x^5 - x^3$

(ii) $121.5a^2bc + 12.15ab^2$

(iii) $0.001a^2 + 0.0001ab$

10. (i) $2m + m^2$

11. (i) $25ln + 5l^2$

(ii) $-7ac + 6bc + 4c^2 - 3a^2 - ab - 2b^2$

12. $x^3 - \frac{4}{5}xy^2 - \frac{5}{4}x^2y + y^3$

13. $3x^4 + 7x^2y^3 + 2y^4$

2. $9y^2 - \frac{3}{2}y + 13$

15. $7y^2 + y^3 - \frac{2}{7}y^4$

4. (i) 30 abcxyz (ii) $m^3n^3p^3$ (iii) $64q^6$

16. (i) $12x^4 - 75y^4$

(ii) $-225x^{18} + 90x^{17} + 675x^{16} - 270x^{15}$

17. $2x^4 + 2x^3 - 21x^2 + 43x - 35$

8. $36x^4t^4 - 84x^2y^2t^2 + 49y^4$ (ii) $\frac{1}{4}x^4 - \frac{xy}{5} + \frac{1}{25}y^2$

18. $\frac{7}{2}$

19. (i) $\frac{9}{16}x^2 - \frac{25}{36}y^2$ (ii) $4a^2 - \frac{9}{b^2}$

(iii) $b^4 - a^4$ (iv) $a^2 - c^2$

20. ± 5

21. 116

22. (i) $x^4 + x^2 + 1$, (ii) $x^4 - 2x^2 + 4$

23. (i) 4896 (ii) 9999 (iii) 4891 (iv) 10455

EXERCISE # 2

Q.1 If $\left(x+\frac{1}{x}\right)=3$, then find value of $\left(x^2+\frac{1}{x^2}\right)$.

Q.2 If $\left(x-\frac{1}{x}\right)=\frac{1}{2}$, then find value of $\left(4x^2+\frac{4}{x^2}\right)$.

Q.3 If $\left(x+\frac{1}{x}\right)=4$, then find value of $\left(x^4+\frac{1}{x^4}\right)$.

Q.4 If $\left(x+\frac{1}{x}\right)=\sqrt{3}$, then find the value of $\left(x^3+\frac{1}{x^3}\right)$

Q.5 If $\left(x+\frac{1}{x}\right)=2$, then find the value of $\left(x^3+\frac{1}{x^3}\right)$

Q.6 If $\left(x^2+\frac{1}{x^2}\right)=102$, then find the value of $\left(x-\frac{1}{x}\right)$

Q.7 If $\left(x^4+\frac{1}{x^4}\right)=322$, then find the value of $\left(x-\frac{1}{x}\right)$

Q.8 If $\left(x^3+\frac{1}{x^3}\right)=52$, then find the value of $\left(x+\frac{1}{x}\right)$

Q.9 If $\left(x^3-\frac{1}{x^3}\right)=14$, then find the value of $\left(x-\frac{1}{x}\right)$.

Q.10 If x is an integer such that $\left(x+\frac{1}{x}\right)=\left(\frac{17}{4}\right)$, then find the value of $\left(x-\frac{1}{x}\right)$

Q.11 If $\left(x^4+\frac{1}{x^4}\right)=727$, then find the value of $\left(x^3-\frac{1}{x^3}\right)$

Q.12 If $\left(2x-\frac{3}{x}\right)=5$, then find the value of $\left(4x^2-\frac{9}{x^2}\right)$

Q.13 If $x + y = 7$ and $xy = 12$, then find the value of $(x^2 + y^2)$

Q.14 If $\frac{5^x}{125}=1$, then find the value of x

Q.15 Find the values of -

(i) 998^2 (ii) 5.2^2
(iii) 78×82 (iv) 1.05×9.5
(v) $51^2 - 49^2$ (vi) $(1.02)^2 - (0.98)^2$
(vii) $12.1^2 - 7.9^2$ (viii) 103×104
(ix) 5.1×5.2 (x) 9.7×9.8

Q.16 Show that

(i) $(3x + 7)^2 - 84x = (3x - 7)^2$
(ii) $(9p - 5q)^2 + 180pq = (9p + 5q)^2$
(iii) $\left(\frac{4}{3}m-\frac{3}{4}n\right)^2+2mn=\frac{16}{9}m^2+\frac{9}{16}n^2$
(iv) $(4pq + 3q)^2 - (4pq - 3q)^2 = 48pq^2$
(v) $(a-b)(a+b)+(b-c)(b+c)+(c-a)(c+a)=0$

ANSWER KEY

EXERCISE # 2

1. 7

2. 9

3. 194

4. 0

5. 2

6. 10

7. 4

8. 4

9. 2

10. 15/4

11. 140

12. 35

13. 25

14. 3

15. (i) 996004 (ii) 27.04 (iii) 6396 (iv) 9.975 (v) 200 (vi) 0.08 (vii) 84
(viii) 10712 (ix) 26.52 (x) 95.06