QUESTIONS

1. $a^2b^3 \times 2ab^3 \times 3a^2b^2$ is equal to

(a) $6a^5b^7$ (b) $7a^2b^2$ (c) $8a^2b^2$ (d) $6a\,b^2$

2. 9 taken away from the sum of x and y is

(a) $x+y-9$ (b) $9-(x+y)$ (c) $xy-4$ (d) $xy+4$

3. The product of x and y is decreased by 4, is written as

(a) $4-xy$ (b) $x(y-4)$ (c) $xy-4$ (d) $xy+4$

4. The population of a dragonfly is x now. It becomes y times itself after one week. What will be its population after 2 weeks.

(a) y^2x (b) x^2y^2 (c) xy^3 (d) x^3y

5. The method of finding solution by trying out various values for the variable is called

(a) Error method (b) Trial and error method

(c) Testing method (d) Checking method

6. If $\frac{x}{2}-\frac{x}{3}=5$, then $x=?$

(a) 8 (b) 16 (c) 24 (d) 30

7. If the sum of a number and its two fifth is 70. The number is

(a) 20 (b) 50 (c) 60 (d) 80

8. $0.3x+0.4=0.28x+1.16$ find $x=?$

(a) 38 (b) 40 (c) 60 (d) 70

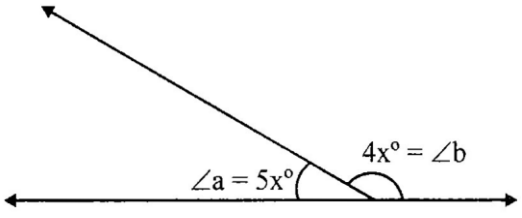
9. For which equation, is $x=-3$ a solution?

(a) $3x-5=10$ (b) $7=-10+x$ (c) $\frac{x}{3}+3=2$ (d) $3x=9$

10. Find the value of $2x-y+z$, when $x=1,\ y=-2,\ z=-1$

(a) 3 (b) 5 (c) 6 (d) 7

11. In the given figure, magnitudes of angles a and b are respectively.



(a) 100°, 80° (b) 60°, 70° (c) 40°, 140° (d) 50°, 130°

12. Simplify: $15a-\left[8a^3+3a^2-\left\{8a^2\left(4-2a-a^2\right)-5a^3\right\}\right]$

(a) $-12a^3+5a^2+19a-4$ (b) $3a^2b^2+5a$

(c) $5a^2+6a^2+2a+3$ (d) $3x^2z-3yz+3xy+7z$

13. What should be added to $xy + yz + zx$ to get $-xy - yz - zx$?

(a) $-2xy - 2yz - 2zx$ (b) $-3xy - yz - zx$

(c) $-3xy - 3yz - 3zx$ (d) $-3xy - yz$

14. Solve $\frac{12}{7}(x-5) = 24 + 8x$

(a) $\frac{-57}{11}$ (b) $\frac{57}{11}$ (c) $\frac{67}{11}$ (d) $\frac{-67}{11}$

15. The sum of two consecutive even numbers is 86. Find the greatest number

(a) 42 (b) 44 (c) 40 (d) 45

16. If $(3x-4)(5x+7) = 15x^2 - ax - 28a$ then $a = ?$

(a) 1 (b) -1 (c) -3 (d) 4

17. If $A = \frac{9x^4 - 3x^3 - 6x^2 - 9x}{3x}$, $B = \frac{18x^4 + 12x^3 + 6x^2 + 9x}{3x}$ then $B - A$ is

(a) $3x^2 - 5x^2 - 4x + 6$ (b) $3x^3 + 5x^2 + 4x + 6$

(c) $3x^3 - 5x^2 - 4x - 6$ (d) $3x^3 + 5x^2 - 4x - 6$

18. The value of $\left(a^3 - 2a^2 + 4a - 5\right) - \left(a^2 + 2a^2 - 8a + 5\right)$

(a) $2a^3 - 4a^2 + 12a - 10$ (b) $2a^3 - 4a^2 - 12a + 10$

(c) $2a^3 + 4a^2 + 12a + 10$ (d) $2a^3 - 4a^2 + 12a + 10$

19. Additive inverse $x^2 - x + 2$

(a) $-x^2 + x - 2$ (b) $x^2 + x + 2$ (c) $-x^2 - x + 2$ (d) $-x^2 + x + 2$

20. If $x = 2$, $y = 3$ and $z = -5$ then $x^3 + y^3 + z^3 = ?$

(a) 90 (b) -90 (c) 0 (d) $-90xyz$

21. If $\left(x + \frac{1}{x}\right) = \frac{10}{3}$, then $\left(x - \frac{1}{x}\right)^2$ is

(a) $\left(\frac{7}{3}\right)^2$ (b) $\left(\frac{8}{3}\right)^2$ (c) $\left(\frac{10}{3}\right)^2$ (d) $\left(\frac{5}{3}\right)^2$

22. If $9x^2 + 48 + p$ to be a perfect square , then the value of p is

(a) 81 (b) 64 (c) 36 (d) 16

23. Solve: $\frac{3}{4}(7x-1) - \left(2x - \frac{1-x}{2}\right) = x + \frac{3}{2}$ then $x = ?$

(a) 1 (b) 2 (c) 3 (d) 4

24. Kajal's father is thrice as old as Kajal. After 12 year he will be just twice his daughter. Find their present ages.

(a) 12 years, 36 years (b) 15 years, 45 years

(c) 40 years, 20 years (d) 10 years, 12 years

25. If $4x^2 + y^2 = 40$ and $xy = 6$, find the value of $2x + y = ?$

(a) ± 8 (b) ± 6 (c) ± 7 (d) ± 5

26. If $x-\frac{1}{x}=9,$ find the value of $ax^2+\frac{1}{x^2}=?$

(a) 83 (b) 84 (c) 85 (d) 86

27. A number is 56 greater then the average of its third, quarter and one twelfth. Find it.

(a) 53 (b) 72 (c) 85 (d) 86

28. After 12 years I shall be 3 times as old as I was 4 years ago. Find my present age.

(a) 12 years (b) 13 years (c) 14 years (d) 18 years

29. Three prizes are to be distributed in a Mental Ability quiz contest. The value of the second prize is five-sixths the value of the first prize and the value of the third prize is four-fifths that of the second prize. If the total value of three prizes is Rs.150, find the value of third prize.

(a) Rs. 40 (b) Rs. 50 (c) Rs. 60 (d) Rs. 120

30. For her mobile phone service, Sachi pays Rs.145 per month and 75 paise for each extra minute. She talks over the allowed number of minutes in the monthly plan. She received a bill of Rs.178 last month. How many extra minutes did she use her phone beyond the allowed time.

(a) 46 min (b) 44 min (c) 55 min (d) 48 min

31. $x+\frac{1}{x}=1$ then find $x^{30}+x^{27}+x^{36}+x^{33}-1$

(a) 2 (b) 6 (c) 3 (d) 8

32. $y+\frac{1}{y}=0$ then find $y^{1001}+y^{999}+1$

(a) 1 (b) 2 (c) 3 (d) None of these

33. $(a+b)^2-(a-b)^2+(a-b)(a+b)-4ab=?$

(a) a^2-b^2 (b) b^2+c^2 (c) c^2+d^2 c (d) None

34. $\frac{x}{1-x}+\frac{y}{1-y}+\frac{z}{1-z}=1$ then, find $\frac{1}{1-x}+\frac{1}{1-y}+\frac{1}{1-z}=?$

(a) 1 (b) 2 (c) 3 (d) 4

35. If $\frac{1}{a+1}+\frac{2}{b+2}+\frac{1001}{c+1001}=1$ then find $\frac{a}{a+1}+\frac{b}{b+2}+\frac{c}{c+1001}=?$

(a) –1 (b) 2 (c) 4 (d) –3

36. If $x+\frac{1}{x}=1,$ then find $x^6=?$

(a) 1 (b) 2 (c) 3 (d) 4

37. If $a+\frac{4}{a}=4$ (Here $a\neq 0$) then find $a^2+\frac{1}{a^3}=?$

(a) $2\frac{1}{8}$ (b) $3\frac{1}{8}$ (c) $4\frac{1}{8}$ (d) $5\frac{1}{8}$

38. If $x = y = z$ then find $\dfrac{(x+y+z)^2}{x^2+y^2+z^2}$

(a) 9 (b) 3 (c) 4 (d) 1

39. If $x + \dfrac{1}{x} = 5$ (where $x \neq 0$) then find $\dfrac{2x}{3x^2 - 5x + 3} = ?$

(a) $\dfrac{1}{2}$ (b) $\dfrac{1}{3}$ (c) $\dfrac{1}{4}$ (d) $\dfrac{1}{5}$

40. If $x^2 + y^2 + 2y + 4x + 5 = 0$ then find $\dfrac{x-y}{x+y} = ?$

(a) 3 (b) –3 (c) $\dfrac{1}{3}$ (d) $\dfrac{-1}{3}$

ANSWER - KEY				
1. A	**2.** A	**3.** C	**4.** A	**5.** B
6. D	**7.** B	**8.** A	**9.** C	**10.** A
11. A	**12.** A	**13.** A	**14.** A	**15.** B
16. B	**17.** B	**18.** A	**19.** A	**20.** B
21. B	**22.** B	**23.** A	**24.** A	**25.** A
26. A	**27.** B	**28.** A	**29.** A	**30.** B
31. C	**32.** A	**33.** A	**34.** D	**35.** B
36. A	**37.** C	**38.** B	**39.** D	**40.** D

SOLUTIONS

1. $a^3b^3 \times 2ab^2 \times 3a^2b^2 = 6a^5b^7$

2. Sum of x and $y = x + y$

And 9 is taken:

$\Rightarrow x + y - 9$

3. Product of x and $y = x \times y = xy$

And then decreased by 4

$= xy - 4$

4. $\because$ Total population $= x$

Now, in one week, population become times

$\therefore$ Now, population after one week $= x \times y = xy$

$\therefore$ Now, population after two week $= xy \times y = xy^2$

5. (B) $\rightarrow$ Trial and error method

6. $\frac{x}{2} - \frac{x}{3} = 5$

$\frac{3x - 2x}{6} = 5$

$x = 30$

7. Let the number be x .

Now, its two - fifth $= \frac{2}{5} \times x = \frac{2x}{5}$

A/Q,

$\frac{x}{1} + \frac{2x}{5} = 70 \Rightarrow \frac{7x}{5} = 70$

$\therefore \quad x = \frac{70 \times 5}{7} = 50$

8. $\Rightarrow 0.3x + 0.4 = 0.28x + 1.16$

$\Rightarrow 0.3x - 0.28x = 1.16 - 0.40$

$\Rightarrow 0.02x = 0.76$

$\therefore \quad x = \frac{0.76 \times 100}{0.02 \times 100} = 38$

9. By going through option, check it In option (c):-

$\frac{x}{3} + 3 = 2 \Rightarrow \frac{x}{3} = 2 - 3 \Rightarrow \frac{x}{3} = -1$

$\therefore x = -3$

10. $2x - y + z$

$2\times1-(-2)+(-1)$

$=2+2-1=4-1=3$

11. A/Q,

$\Rightarrow \quad 5x+4x=180°$ (by linear pair)

$\Rightarrow \quad 9x=180°$

$\therefore \quad x=20°$

$\therefore \quad 5x=5\times20°=100°$

$\therefore \quad 4x=4\times20°=80°$

Hence $\angle A=100°$ and $\angle B=80°$

12. $15a-\left[8a^3+3a^2-\left\{8a^2-(4-2a-a^3)-5a^3\right\}-2a\right]=15a-[8a^3+3a^3+4a^3-8a^2+4-2a-2a]$

$=15a-\left[12x^3-5a^2-4a+4\right]$

$=15a-12a^3+5a^2+4a-4$

$=-12a^3+5a^2+19a-4$

13. Let added number be p.

$\Rightarrow (xy+yz+zx)+p=-xy-yz-zx$

$\Rightarrow p=-xy-yz-zx-(xy+yz+zx)$

$=xy-yz-zx-xy-yz-zx$

$=-2xy-2yz-2zx$

14. $\frac{12}{7}(x-5)=\frac{24+8x}{1}$

$\Rightarrow 12(x-5)=7(24+8x)$

$\Rightarrow 12x-60=168x+56x$

$\Rightarrow -60-168=56x-12x$

$\Rightarrow -228=44x$

$\therefore \quad x=\frac{-228}{44}=\frac{-57}{11}$

15. Let the two consecutive even No. be x and $x+2$.

A/Q,

$x+x+2=86$

$\Rightarrow 2x=84$

$\therefore x=42$

$\therefore$ Greatest no. $=x+2=42+2=44$

Hence, greatest no. is 44.

16. $(3x-4)(5x+7)=15x^2-ax-28.$

$15x^2+21x-20x-28=15x^2-ax-28$

$\Rightarrow 15x^2 + x - 28 = 15x^2 + ax - 28$

$\Rightarrow x = -ax$

$\therefore a = \dfrac{x}{-x} = -1$

$\therefore a = -1$

17. $A = \dfrac{9x^4}{3x} - \dfrac{3x^3}{3x} - \dfrac{6x^2}{3x} - \dfrac{9x}{3x}$

$= 3x^3 - x^2 - 2x - 3$

$B - A = \left(6x^3 + 4x^2 + 2x + 3\right) - \left(3x^3 - x^2 - 2x - 3\right) = 6x^3 - 3x^3 + 4x^2 + x^2 + 2x + 2x + 3 + 3$

$= 3x^3 + 5x^2 + 4x + 6$

18.

$= a^3 - 2a^2 + 4a - 5$

$-a^3 + 2a^2 - 8a + 5$

$+ \quad - \quad + \quad -$

$2a^3 - 4a^2 + 12a - 10$

19. Additive inverse $= -\left(x^2 - x + 2\right)$

$= -x^2 + x - 2$

20. $x^3 + y^3 + z^3$

$= (2)^3 + (3)^3 + (-5)^3$

$= 8 + 27 - 125$

$= 35 - 125 = -90$

21. $\Rightarrow \quad x + \dfrac{1}{x} = \dfrac{10}{3}$

squaring both sides,

$\Rightarrow \quad \left(x + \dfrac{1}{x}\right)^2 = \left(\dfrac{10}{3}\right)^2$

$= x^2 + \dfrac{1}{x^2} + 2 = \dfrac{100}{9}$

$\Rightarrow x^2 + \dfrac{1}{x^2} = \dfrac{100}{9} - 2$

$\Rightarrow x^2 + \dfrac{1}{x^2} = \dfrac{82}{9}$

Now, subtracting 2 both side,

$\Rightarrow x^2 + \dfrac{1}{x^2} - 2 = \dfrac{82}{9} - 2$

$= \left(x - \dfrac{1}{x}\right)^2 = \dfrac{64}{9}$

$\therefore \left(x-\frac{1}{x}\right)^2=\left(\frac{8}{3}\right)^2$

22. Now according to method of undetermined coefficient

Let $9x^2+48x+p=(ax+b)^2$

$\Rightarrow 9x^2+48x+p=a^2x^2+b^2+2abx$

Now comparing the coefficient

$\Rightarrow 9x^2=a^2x^3 \quad \therefore a=3$

$2abx=48x$

$b=\frac{24}{a}=\frac{24}{3}=8$

$\Rightarrow b^2=p$

$(8)^2=p$

$\therefore p=64$

23. $\frac{3}{4}(7x-1)-\left(2x-\frac{1-x}{2}\right)=x+\frac{3}{2}$

$\Rightarrow \frac{21x-3}{4}-\left\{\frac{4x-(1-x)}{2}\right\}=x+\frac{3}{2}$

$\Rightarrow \frac{21x-3}{4}-\frac{5x-1}{2}-x=\frac{3}{2}$

$\frac{21x-3-2(5x-1)-4x}{4}=\frac{3}{2}$

$21x-3-10x+2-4x=6$

$7x-1=6$

$\therefore x=\frac{7}{7}=1$

$7x-1=6$

24. Let the present age of Kajal be x years, then the present age of Kajal's father be $3x$ yrs. After 12 yrs, Kajal's age $=x+12$ years.

After 12 yrs, Kajal's father age $\Rightarrow 3x+12$ years

A/Q,

$3x+12=2(x+12)$

$\Rightarrow 3x+12=2x+24$

$\therefore x=12$

Kajal's age $=12$ years

His father's age $=12\times3=36$ years

25. $4x+y^2=40$

Now,

$(2x)^2 + (y)^2 = 40$

Adding, 4xy both sides,

$(2x)^2 + (y)^2 + 2.2x.y = 40 + 4xy$

$(2x + y)^2 = 40 + 4 \times 6$

Therefore, $2x + y = \pm\sqrt{64} = \pm 8$

26. $x - \frac{1}{x} = 9$

Squaring both side

$\Rightarrow \left(x - \frac{1}{x}\right)^2 = (9)^2$

$\Rightarrow x^2 + \frac{1}{x^2} - 2 = 81$

$\therefore x^2 + \frac{1}{x^2} = 81 + 2 = 83$

27. Let the number be x ,

A/Q,

$x = 56 + \frac{\frac{x}{3} + \frac{x}{4} + \frac{x}{12}}{3}$

$\Rightarrow x = 56 + \frac{\frac{4x + 3x + x}{12}}{3}$

$\Rightarrow x = 56 + \frac{8x}{3 \times 12}$

$\Rightarrow x - \frac{2x}{9} = 56$

$\Rightarrow \frac{7x}{9} = 56$

$\therefore x = 72$

Hence the number is 72.

28. Let my present age be x years

My age after 12 years = $x + 12$

My age before 4 years ago $= x - 4$

A/Q,

$x + 12 = 3(x - 4)$

$\Rightarrow x + 12 = 3x - 12$

$\Rightarrow 24 = 2x$

$\therefore\ x = 12$

$\therefore$ My present age $= 12$ years

29. Let the value of first prize $= x$ rupees

$\therefore$ The value of second prize $= \dfrac{5x}{6}$

$\therefore$ The value of third prize $= \dfrac{4}{5} \times \dfrac{5x}{6} = \dfrac{4x}{6}$

A/Q,

$x + \dfrac{5x}{6} + \dfrac{4x}{6} = 150$

$\Rightarrow \dfrac{15x}{6} = 150$

$\therefore\ x = 60$

$\therefore$ Value of third prize $= \dfrac{4 \times 60}{6} = 40$ Rupees

30. Total paid money per month $=$ *Rs.* 145 .

She get money on each extra mins $=$ 75 paise $=$ *Rs.* $\dfrac{75}{100} =$ *Rs.* $\dfrac{3}{4}$

But, the received money by $=$ *Rs.* 178

$\therefore$ money get in each extra mins in a month $=$ *Rs.*$(178 - 145) = 33$

$\therefore$ Rs. $\dfrac{3}{4}$ get money in 1 mins.

$\therefore$ Rs. 33 get money in $\dfrac{33 \times 1 \times 4}{3} = 44$ min

31. $x + \dfrac{1}{x} = 1$

$x^2 + 1 = x$

$x^2 - x + 1 = 0$

multiplying both side by $x + 1$

$(x + 1)(x^2 - x + 1) = 0$

$x^3 - 1 = 0$

$x^3 = 1$

Now, $x^{30} + x^{27} + x^{36} + x^{33} - 1$

$= 1 + 1 + 1 + 1 - 1 = 3$

32. $y + \dfrac{1}{y} = 0$

$y^2 + 1 = 0$

then $y^{1000} + y^{999} + 1$

$y^{999}(y^2+1)+1$

$0+1=1$

33. $a^2+b^2+2ab-a^2+2ab+b^2+a^2-b^2-4ab$

$=a^2-b^2$

34. $\frac{x}{1-x}+\frac{y}{1-y}+\frac{z}{1-z}=1$

Adding both sides by 3

$\frac{x}{1-x}+1+\frac{y}{1-y}+1+\frac{z}{1-z}+1=4$

$\frac{x+1-x}{1-x}+\frac{y+1-y}{1-y}+\frac{z+1-z}{1-z}=4$

$\frac{1}{1-x}+\frac{1}{1-y}+\frac{1}{1-z}=4$

35. $\frac{1}{a+1}+\frac{2}{b+2}+\frac{1001}{c+1001}=1$

Subtracting both side by 3

$\frac{1}{a+1}-1+\frac{2}{b+2}-1+\frac{1001}{c+1001}-1=4-3$

$\frac{1-a-1}{a+1}+\frac{2-b-2}{b+2}+\frac{1001-c-1001}{c+1001}=-2$

$\frac{-a}{a+1}+\frac{-b}{b+2}+\frac{-c}{c+1001}=-2$

$-1\left(\frac{a}{a+1}+\frac{b}{b+2}+\frac{c}{c+1001}\right)=-2$

$\frac{a}{a+1}+\frac{b}{b+2}+\frac{c}{c+1001}=2$

36. $x+\frac{1}{x}=1$

$x^2+1=x$

$x^2-x+1=0$

Multiplying both side by $x+1$

$(x+1)(x^2-x+1)=0$

$x^3+1=0$

$x^3=-1$

Now, $x^6=(x^3)^2=(-1)^2=1$

37. $a+\frac{4}{a}=4$

$a^2+4=4a$

$a^2 - 4a + 4 = 0$

$(a-2)^2 = 0$

$\therefore\ a = 2$

Now, $a^2 + \frac{1}{a^3}$

$2^2 + \frac{1}{2^3}$

$4 + \frac{1}{8}$

$4\frac{1}{8}$

38. $x = y = z$, then

$$\frac{(x+y+z)^2}{x^2+y^2+z^2} = \frac{(x+x+x)^2}{x^2+x^2+x^2} = \frac{(3x)^2}{3x^2}$$

$$= \frac{9x^2}{3x^2} = 3$$

39. $x + \frac{1}{x} = 5$

Then

$$\frac{2x}{3x^2-5x+3} = \frac{\frac{2x}{3}}{\frac{3x^2}{x} - \frac{5x}{x} + \frac{3}{x}}$$

$$= \frac{2}{3x + \frac{3}{x} - 5}$$

$$= \frac{2}{3\left(x + \frac{1}{x}\right) - 5} = \frac{2}{3\times 5 - 5} = \frac{2}{10} = \frac{1}{5}$$

40. $x^2 + 4x + 4 + y^2 + 2y + 1 = 0$

$(x+2)^2 + (y+1)^2 = 0$

$(x+2)^2 = 0,\ x = -2$

$(y+1)^2 = 0,\ y = -1$

Now, $\frac{x-y}{x+y} = \frac{-2+1}{-2-1} = \frac{-1}{-3} = \frac{1}{3}$