

## Prayas JEE 2026

## Mathematics

## Basic Maths

DPP: 3

**Q1** If  $x^2 + 5y^2 + z^2 - 4xy + 2yz = 0$

$x, y, z \neq 0, x, y, z \in R$  then

- (A)  $\frac{x}{y} = 2$   
 (B)  $\frac{x}{y} + \frac{y}{z} = 1$   
 (C)  $\frac{x}{y} - \frac{y}{z} = 3$   
 (D)  $\frac{x}{z} = -2$

**Q2** If  $a, b, c \in N$ , then find the least positive value of  $a^2 + b^2 + c^2 - ab - bc - ca$ .

- (A) 18 (B) 9  
 (C) 3 (D) 1

**Q3** One of the factor of  $x^6 - 10x^3 - 27$  is

- (A)  $(x^2 + x - 3)$   
 (B)  $(x^2 + x + 3)$   
 (C)  $(x^2 - x + 3)$   
 (D)  $(x^2 - x - 3)$

**Q4** If  $(a^2 + b^2 + c^2)(x^2 + y^2 + z^2)$ , Show that  
 $= (ax + by + cz)^2$   
 $x : a = y : b = z : c$

**Q5** Find the value of  $a$ , if  $x - a$  is a factor of  $x^3 - a^2x + x + 2$ .

**Q6** Find the value of  $l$  and  $m$  is  
 $8x^3 + lx^2 - 27x + m$  is divisible by  
 $2x^2 - x - 6$

**Q7** A polynomial in  $x$  of the third degree which will vanish when  $x = 1$  and  $x = -2$  and will have the values 4&28 when  $x = -1$  and  $x = 2$  respectively is \_\_\_\_\_.

**Q8** If  $x = b + c, y = c + a, z = a + b$ , then find the value of  $\frac{x^2 + y^2 + z^2 - xy - yz - zx}{a^2 + b^2 + c^2 - ab - bc - ca}$

**Q9** If  $a + b + c = 0$ , then the value of  $\frac{a^2(b+c) + b^2(c+a) + c^2(a+b)}{abc}$  is

- (A) 3  
 (B) -3  
 (C)  $-\frac{1}{3}$   
 (D)  $\frac{1}{3}$

**Q10** If  $a + b = 5$ , then

$a^2 + b^2 - 10a - 10b + 2ab + 5$  is

- (A) -20 (B) 30  
 (C) -25 (D) 35

**Q11** If  $a + b + c = 19, ab + bc + ca = -13$ , then the value of  $a^2 + b^2 + c^2$  is equal to

- (A) 346 (B) 345  
 (C) 387 (D) 361

**Q12** If  $\frac{x}{7} = \frac{y}{11} = \frac{z}{13} = \frac{2x-3y+z}{m}$ , then the value of  $m$  is

- (A) 6  
 (B) -6  
 (C)  $\frac{1}{6}$   
 (D)  $-\frac{1}{6}$

**Q13** Find the value of  $\frac{a^3 + b^3 + c^3 - 3abc}{ab + bc + ca - a^2 - b^2 - c^2}$ , when  $a = -5, b = -6, c = 10$

- (A) 1 (B) -1  
 (C) 2 (D) -2

**Q14**



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Simplify:  $(3a - 4b)(9a^2 + 12ab + 16b^2) + (4a - 3b)(16a^2 + 12ab + 9b^2)$

(A)  $91a^3 + 91b^3$

(B) 0  
(C)  $91a^3 - 91b^3$   
(D) 1



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## Answer Key

Q1 (A, B, C, D)

Q2 (D)

Q3 (D)

Q4 proof

Q5  $a = -2$

Q6  $l=2, m=-18$

Q7  $P(x) = (x - 1)(x + 2)(3x + 1)$

Q8 1

Q9 (B)

Q10 (A)

Q11 (C)

Q12 (B)

Q13 (A)

Q14 (C)



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