

MATHS

BOOKS - CENGAGE MATHS (ENGLISH)

EQUATION OF PLANE AND ITS APPLICATIONS -II



1. Let A(0, 6, 6), B(6,6,0) and C(6,0,6) are three points and point D is moving on the line x + z - 3 = 0 = y. If G is centroid of ΔABC , then minimum value of GD is

A.
$$\sqrt{\frac{47}{2}}$$

B.
$$\sqrt{\frac{37}{2}}$$

C. $\sqrt{\frac{57}{2}}$
D. $\sqrt{\frac{23}{2}}$

Answer: C

2. Equation of line of projection of the line

$$3xy + 2z - 1 = 0 = x + 2y - z = 2$$
 on the plane
 $3x + 2y + z = 0$ is
A. $\frac{x+1}{11} = \frac{y-1}{-9} = \frac{z-1}{-15}$
B. $3x - 8y + 7z + 4 = 0 = 3x + 2y + z$

C.
$$\frac{x+12}{11} = \frac{y+8}{-9} = \frac{z+14}{15}$$

D. $\frac{x+12}{11} = \frac{y+8}{-9} = \frac{z+14}{-15}$

Answer: B

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3. The orthocenter of triangle whose vertices are A(a, 0, 0), B(0, b, 0) and C(0, 0, c) is $\left(\frac{k}{a}, \frac{k}{b}, \frac{k}{c}\right)$ then k is equal to

A.
$$\left(\frac{1}{a^2} + \frac{1}{b^2} + \frac{1}{c^2}\right)^{-1}$$

B. $\left(\frac{1}{a} + \frac{1}{b} + \frac{1}{c}\right)^{-1}$
C. $\left(\frac{1}{a^2} + \frac{1}{b^2} + \frac{1}{c^2}\right)$

$$\mathsf{D}.\left(\frac{1}{a} + \frac{1}{b} + \frac{1}{c}\right)$$

Answer: A

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B. $\sqrt{2}$ units

C.
$$\frac{3}{\sqrt{2}}$$
 units
D. $\frac{\sqrt{3}}{2}$ units



5. If plane 2x + 3y + 6z + k = 0 is tangent to the sphere $x^2 + y^2 + z^2 + 2x - 2y + 2z - 6 = 0$, then a value of k is (a) 26 (b) 16 (c) -26 (d) none of these

A. 26

B. 16

 $\mathsf{C.}-26$

D. none of these



6. The shorteast distance from (1, 1, 1) to the line of intersection of the pair of planes $xy + yz + zx + y^2 = 0$ is A. $\sqrt{\frac{8}{3}}$ B. $\frac{2}{5}$

B.
$$\frac{2}{\sqrt{3}}$$

C. $\frac{1}{\sqrt{3}}$
D. $\frac{2}{3}$



7. A variable plane makes intercepts on X, Y and Z-axes and it makes a tetrahedron of volume 64cu. Units. The locus of foot of perpendicular from origin on this plane is

A.
$$\left(x^2+y^2+z^2
ight)^2=384xyz$$

$$\mathsf{B.}\,xyz=681$$

C.
$$(x + y + z) \left(\frac{1}{x} + \frac{1}{y} + \frac{1}{z} \right)^2 = 16$$

D.
$$xyz(x+y+z)=81$$

Answer: A

8. If the projection of the line $\frac{x}{2} = \frac{y-1}{2} = \frac{z-1}{1}$ on a plane P is $\frac{x}{1} = \frac{y-1}{1} = \frac{z-1}{-1}$. Then the distance of plane P from origin is

A. $\sqrt{3}$ B. $\sqrt{\frac{3}{2}}$ C. $\sqrt{6}$

D.
$$\frac{2}{\sqrt{3}}$$

Answer: B



9. The locus of point which moves in such a way that its distance from the line $\frac{x}{1} = \frac{y}{1} = \frac{z}{-1}$ is twice the distance from the plane x + y + z = 0 is

A.
$$x^2 + y^2 + z^2 - 5x - 3y - 3z = 0$$

B. $x^2 + y^2 + z^2 - 5x + 3y + 3z = 0$
C. $x^2 + y^2 + z^2 + 5xy + 3yz + zx = 0$
D. $x^2 + y^2 + z^2 + 5xy + 3yz + 3zx = 0$

Answer: C

10. A line is drawn from the point P(1,1,1)and perpendicular to a line with direction ratios, (1,1,1) to intersect the plane x + 2y + 3z = 4 at Q. The locus of point Q is

A.
$$rac{x}{1} = rac{y-5}{-2} = rac{z-+2}{1}$$

B. $rac{x}{-2} = rac{y-5}{1} = rac{z+2}{1}$

$$\mathsf{C}.\, x=y=z$$

D. none of these



11. Let a plane pass through origin and be parallel to the line $\frac{x-1}{2} = \frac{y+3}{-1} = \frac{z+1}{-2}$ is such that distance between the plane and the line is $\frac{5}{3}$. Then equation of the plane is/are

A.
$$x-2y+2z=0$$

$$\mathsf{B.} x - 2y - 2z = 0$$

C.
$$2x+2y-z=0$$

D.
$$x+y+z=0$$

Answer: A::C

12. The planes ax + 4y + z = 0, 2y + 3z - 1 = 0 and 3x - bz + 2 = 0 will

A. meet at a point if ab
eq 15.

B. meet on a line if ab =15, a=3

C. have no common point if ab=15, a
eq 3.

D. have no common point if ab=15, a
eq 5

Answer: A::B::C

13. If the line
$$rac{x}{1}=rac{y}{2}=rac{z}{3}$$
 intersects the the line $3eta^2+3(1-2lpha)y+z=3-rac{1}{2}ig\{6lpha^2x+3(1-2eta)y+2zig\}$

then point $(\alpha, \beta, 1)$ lies on the plane

A.
$$2x - y + z = 4$$

B.
$$x + y - z = 0$$

C.
$$x - 2y = 0$$

$$\mathsf{D}.\,2x-y=0$$

Answer: A::B::C

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14. Let A = (1, 1, -1), B = (0, 2, 1) be two given points. Also, let P:x + y + z = 0 be a plane.

If A' and B' are the feet of perpendicular from A and B, respectively, on the plane 'P' then A'B' equals

A.
$$\frac{\sqrt{14}}{3}$$

B. $\sqrt{\frac{5}{3}}$
C. $\sqrt{3}$
D. $\sqrt{\frac{2}{3}}$

