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Class: XII
Subject: Math's
Topic: 3-D
No. of Questions: 20
Duration: 60 Min
Maximum Marks: 60

1. The projection of line joining (3,4,5) and (4,6,3) on the line joining (-1,2,4) and (1,0,5) is

   a. $\frac{4}{3}$

   b. $\frac{2}{3}$

   c. $\frac{8}{3}$

   d. $\frac{1}{3}$

Answer: A

2. Equation of the projection of the line 8x-y-7z = 8, x + y + z = 1 on the plane 5x- 4y-z = 5 is

   a. $\frac{x-1}{1} = \frac{y}{2} = \frac{z}{-3}$

   b. $\frac{x}{1} = \frac{y-1}{2} = \frac{z}{-3}$

   c. $\frac{x}{1} = \frac{y}{2} = \frac{z-3}{-3}$

   d. $\frac{x}{1} = \frac{y+1}{-2} = \frac{z+1}{3}$

Answer: A

Sol. Any plane through the given line is
X+y+z-1+λ(8x-y-7z-8)=0..(1)
$\Longrightarrow$(1+8λ)5+(1-λ)(-4)-1(1-7λ)=0
It is perpendicular to the plane
5x-4y-z=5
Λ=0
So that (1) becomes x +y+z 1=0

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Now the line of intersect on of the planes
X+y+z-1=0 and 5l-4m-n =0

$\frac{1}{-1+4} = \frac{m}{5+1} = \frac{n-4}{-4-5}$

$\frac{x-1}{1} = \frac{y}{2} = \frac{z}{-3}$

3. The equation of the sphere circumscribing the tetrahedron whose faces are x=0 y=0, z=0 and $\frac{x}{a} + \frac{y}{b} + \frac{z}{c} = 1$ is

a. $x^2 + y^2 + z^2 = a^2 + b^2 + c^2$
b. $x^2+y^2+z^2$-ax-by-cz=0
c. $x^2+y^2+z^2$-2ax-2by-2cz=0
d. None of these

Detailed answer:

Answer: B

4. The direction coines of two lines at right angles are <l1,m1,n1 > and <l2,m2,n2> Then the d.c of a line ⊥ to both the given lines are

A. <m1n2-m2n1,n1l2-n2l1,l1m2-l2m1>
B. <l1+l2, m1+m2,n1+n2>
C. <l1-l2,m1-m2,n1-n2
D. None of these

Detailed Answer:

Answer: A

5. The shortest distance between the lines
$\frac{x-2}{2}=\frac{y-2}{3}=\frac{z-3}{4}$ and

$\frac{x-2}{2}=\frac{y-4}{4}=\frac{z-5}{5}$ is

A. $\frac{1}{6}$
B. $\frac{1}{\sqrt{6}}$
C. $\frac{1}{\sqrt{3}}$
D. $\frac{1}{3}$

Detailed Answer:

Answer: B

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6. The points A (5,1,-1), B(7,-4,7), C(1,-6,10) and D (1-4,4) are the vertices of
   A. Rhombus
   B. Square
   C. Rectangle
   D. None of these

Detailed answer:

Answer: A

7. The lines $\frac{x-1}{2}=\frac{y-2}{4}=\frac{z-3}{7}$ and $\frac{x-1}{4}$=$\frac{x-1}{4}=\frac{z-3}{7}$ are

A. Parallel
B. Interesting
C. Skew
D. Perpendicular

Answer: A

8. A St line which makes an angle of 600 with each of y and z axes, inclines with x-axis at an angle
   A. 45^o
   B. 30^o
   C. 75^o
   D. 60^o

Detailed Answer:

Answer: A

The plane which passes thro' the point (3,2,0) and the line

9. $\frac{x-3}{1}$=$\frac{y-6}{5}$=$\frac{z-4}{4}$is

   A. X-y+z=1
   B. X+y+z=5
   C. X+2y+z=5

Detailed Answer :

Sol. Any plane thro' the line $\frac{x-3}{1}=\frac{y-6}{5}=\frac{z-4}{4}$ is

a(x-3)+b(2-6)+c(z-4)=0 ….(1)

where a+5b+4c=0……(2)

(1) Passes thro' (3,2,0) if

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(3,3)+b(2-6)+c(0-4)=0
⇒ -4b-4c=0…….(3)
i.e b+c=0….(4)
(2) +(3)-a(y-6)+a(z-4)=0
i.e reqd. planeis
x-3- a(y-6)+a(z-4)=0
i.e x-y+z-1+0

Answer: A

The equation $|\vec{r}|$ –$\vec{r}$.(2$\vec{i}$+4j+2$\vec{k}$) -10= 0 represents a

10. The equation $|\vec{r}|$—= $\vec{r}$. (2$\vec{i}$+4$\vec{j}$-$\vec{k}$)-10=0 represents a
    A. Circle
    B. Plane
    C. Sphere of radius 4
    D. Sphere of radius 3

Detailed Answer:

Answer: B

The ratio in which the plane
$\vec{i}$.($\vec{i}$-2$\vec{j}$+3$\vec{k}$ and

11. 3$\vec{i}$-5$\vec{j}$+8$\vec{k}$ is
    A. 1:5
    B. 1:10
    C. 3:5
    D. 3:10

Detailed Answer:

Answer: D

12. A Plane passes thro' a fixed point (a,,b,c) the locus of the foot of the perpendicular to it from the origin is a sphere of radius

    A. $\sqrt{a^2 + b^2 + c\text{^}2}$
    B. $\frac{1}{2}\sqrt{a^2 + b^2 + c\text{^}2}$
    C. $a^2 + b^2 + c^2$
    D. None of these

Detailed Answer:

Answer: B

If M denotes the mid – point of the line joining A (4$\vec{i}$+5$\vec{j}$-10$\vec{k}$).

13. Then the equation of the through M and perpendicular to AB is
    A. $\vec{r}$.(-5$\vec{i}$-3$\vec{j}$+11$\vec{k}$)+$\frac{135}{2}$ = 0
    B. $\vec{r}$.($\frac{3}{2}\vec{i}$+$\frac{7}{2}\vec{j}$-$\frac{9}{2}\vec{k}$)+$\frac{135}{2}$=0
    C. $\vec{r}$.(4$\vec{i}$+5$\vec{j}$-10$\vec{k}$)+4=0

D. $\vec{r}.(-\vec{i}+2\vec{j}+\vec{k})+4=0$

Detailed Answer:

Answer: A

14. The intersection of the spheres $x^2+y^2+z^2+7x-2y-z=13$ and $x^2+y^2+z^2-3x+3y+4z=8$ is the same as the intersection of one of the sphere and the plane

A. X-y-z=1
B. X-2y-z=1
C. X-y-z=1

Detailed Answer:;

Answer: D

The equation of the plane containing of the line

15. $\frac{x+1}{-3}+\frac{y-3}{2}=\frac{z+2}{1}$ and the point (0,1,-7) is

A. x+y+z=1
B. x+y+z+2
C. x+y+z+0
D. none of these

Detailed Answer:

Answer: C

16. The equation of the plane thro' the line of intersection of the planes x+y+z-6+0,2x+3y+4z+5=0 and the point (1,1,1) is

A. 7x-9y+8z=0
B. 7x+y+8z=0
C.2x-2y-3z=14
D. 20x+12y+26z-36=0

Detailed Answer:

Sol. Any plane thro' the given two planes is

(8x+y+z=-6)+K(2x+3y+4z+5)0

IT passes thro' (1,1,1)

$\therefore$1+1+1-6+K (2+3+4+5)=0

$K=\frac{3}{4}$

$\therefore$ reqd. plane is

$X+y+z-6+\frac{3}{14}(2x+3y+4z+5)=0$

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⇒ 14x 14y +14z-84+6x+9y
12z+15=0

⇒ 20x+23y+26z-69=0

Answer: D

The distance between the line
$\vec{r}=(\vec{i}+\vec{j}-2\vec{k}+\lambda(2\vec{i}+5\vec{j}+3\vec{k}$ and the plane

16. $\vec{r}.(2\vec{i}+\vec{j}-3\vec{k})$ =5 is

A. $\frac{5}{\sqrt{14}}$
B. $\frac{6}{\sqrt{14}}$
C. $\frac{7}{\sqrt{14}}$
D. $\frac{8}{\sqrt{14}}$

Detailed Answer:

Answer: D

17. The number of spheres of radius r and touching the co-ordinate axes is

A. 4
B. 6
C. 8
D. None of these

Detailed Answer:

Answer: C

18. The intercepts of the plane 2x-3y+4z=12 on the co-ordinates axs are given by
A. 2,-3,4
B. 6,-4,-3
C. 6,-4-3
D. 3,-2,1.5

Detailed Answer:

Answer: C

A st. line makes angles α, β, γ, δ with the diagonals of a cune.

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19. Then $\cos^2\alpha+\cos^2\beta+\cos^2\delta$ with the diagonals of a cube,
20. Then $\cos^2 a+\cos^2\beta+\cos^2\gamma+\cos^2\delta=$
    A. 1
    B. 4
    C. $\frac{4}{3}$
    D. $\frac{3}{4}$

Answer: C