SPECIAL FORMS OF 3D (LINE & PLANE)   rk smartmathematics
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FORM-1   INTERSECTING LINES AND THEIR POINT OF INTERSECTION.

Q.1 Show that the lines r=3i+2j-4k +λ(i+2j+2K) and r= 5i-2j+μ(3i+2j+6k) are INTERSECTING. Also find their point of intersection.

FORM-2   FOOT & IMAGE OF A POINT WITH A LINE.

Q.2 Find the coordinates of the FOOT of perpendicular and the length of perpendicular drawn from the point P (5,4,2) to the line r= - i+3j+k+λ(2i+3j-k) . Also find its IMAGE in this line.

FORM-3   FOOT & IMAGE OF A POINT WITH A PLANE.

Q.3 Find the coordinates of the FOOT of perpendicular and the perpendicular distance of the point P (3,2, 1) from the plane 2x-y+z+1=0. Also find its IMAGE in this plane.

FORM-4   POINT OF INTERSECTION OF A LINE AND PLANE.

Q.4 Find the distance of the point P (2, 12, 5) from the POINT OF INTERSECTION of line r=2i-4j+2k +λ (3i+4j+2k) and plane r.(i-2j+k)=0 .

FORM- 5(A) EQUATION OF A LINE PERPENDICULAR TO TWO GIVEN LINES.

Q.5 Find the equation of a LINE passes through (2,-1, 3) and PERPENDICULAR to the lines r= (i+j -k) =λ (2i-2j+k) and r= (2i-j-3k) + μ (i+2j+2K) .

FORM- 5(B)   EQUATION OF A LINE PARALLEL TO TWO GIVEN PLANES.

Q.6 Find the equation of a LINE passes through (1, 2, 3) and PARALLEL to the planes x-y+2z=5 and 3x+y+z=6.

FORM-6(A) EQUATION OF A PLANE PERPENDICULAR TO TWO GIVEN PLANES.

Q.7 Find the equation of a PLANE passes through (1,-1, 2) and is perpendicular to the planes 2x+3y-2z=5   and x+2y-3z= 8 .

FORM-6(B) EQUATION OF A PLANE PARALLEL TO TWO GIVEN LINES.

Q.8 Find the equation of a PLANE passes through (1, 2,-4) and parallel to the lines r=i+2j-4k+λ (2i+3j+6k) and r= i-3j+5k+μ (i+ j - k) .

FORM- 7   EQUATION OF A PLANE CONTAINING ONE OR TWO LINES.

Q.9 Find the equation of a PLANE containing the lines r=2i+j-3k+λ (i+2j+5K)   and   r= 3i+3j+2k+μ (3i-2j+5k).

FORM-8(A)   DISTANCE OF A POINT FROM PLANE MEASURED PARALLEL TO A LINE.

Q.10 Find the DISTANCE of the point (1,-2, 3) from the plane x- y+ z=5 measured parallel to the line r= i+3j-2k+λ (2i+3j - 6k).

FORM- 8(B)   DISTANCE OF A POINT FROM LINE MEASURED PARALLEL TO A PLANE.

Q.11 Find the DISTANCE of the point (2, 3, 4) from the line r= -3i+2j+λ (3i+6j+2k) measured parallel to the plane 3x+2y+2z-5=0.

FORM-9   IMAGE OF A LINE WITH RESPECT TO A PLANE.

Q.12 Find the IMAGE of the line r=i+3j+4k+λ (3i+j-5k) in the plane 2x- y+z+3=0.

FORM-10   FAMILY OF PLANES IN DIFFERENT CONDITIONS.

Q.13 Find the equation of a PLANE passing through the line of intersection of two planes and
A) a given passing point **B)**Perpendicular to a plane **C**) Parallel to a line or any axes. **D)** Relation between their intercepts. **E)** Perpendicular distance is given.

!!..ANSWERS..!!

Q.1 (-1,-6,-12) **Q.2** F(1,6,0) I(-3,8,-2) length=2√6 **Q.3** F(1,3,0) I(-1,4,-1) D=√6 **Q.4** 13 units
Q.5 r=2i-j+3k+λ(-6i-3j+6k) **Q.6** r= i+2j+3k +λ(-3i+5j+4k) **Q.7** 5x-4y-z-7=0 **Q.8** 9x-8y+z+11=0
Q.9 10x+5y-4z=37 **Q.10** 1 unit **Q.11)** √33 units **Q.12** r= -3i+5j+2k+λ (3i+j-5k).