

제출 마감일: 2020년 4월 10일 자정까지

제출 방법: '아주Bb/과제출제/제출'에 upload된 과제를 프린트한 후 풀기 => 풀은 과제를 사진 또는 스캔하여
'아주Bb/과제출제/제출'에 upload => 이것으로 동영상강의학습활동 출결 인정

Let $\vec{u} = \langle -1, 2, 1 \rangle$, $\vec{v} = \langle 3, 1, -1 \rangle$. Then

$$\vec{u} \times \vec{v} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ -1 & 2 & 1 \\ \underline{\hspace{1cm}} & \underline{\hspace{1cm}} & \underline{\hspace{1cm}} \end{vmatrix}$$

$$= \langle \underline{\hspace{1cm}}, \underline{\hspace{1cm}}, \underline{\hspace{1cm}} \rangle$$

Section 12.5 Equations of Lines and Planes

1. (a) Find an equation of the line through the points $P(1, -2, 3)$ and $Q(4, 5, 6)$.

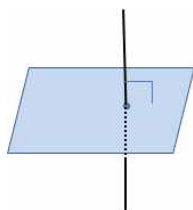
• **parametric** equations:

• **symmetric** equation:

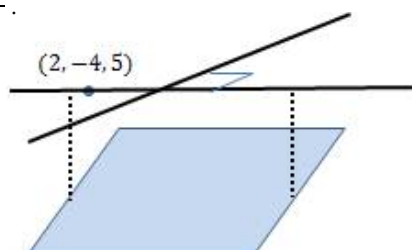
(b) Find **vector** equation for the line segment from $P(1, -2, 3)$ to $Q(4, 5, 6)$.

$\vec{r} =$ _____

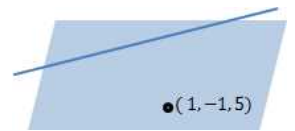
2. Find the **symmetric** equations of the line through $(2, -4, 5)$ that is perpendicular to the plane $3x + y - 2z = 5$.



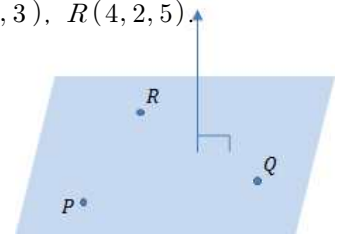
3. Find the **symmetric** equations of the line through $(2, -4, 5)$ that is parallel to the plane $3x + y - 2z = 5$ and perpendicular the line $\frac{x+8}{2} = \frac{y-5}{3} = \frac{z-1}{-1}$.



4. Find the equation of the **plane** that passes through the point $(1, -1, 5)$ and contains the line $x = 1 + 2t$, $y = -1 + 3t$, $z = 4 + t$.



5. (a) Find an equation of the **plane** through the points $P(1, 0, 1)$, $Q(-2, 1, 3)$, $R(4, 2, 5)$.



(b) Find the **area** of the triangle with vertices $P(1, 0, 1)$, $Q(-2, 1, 3)$, $R(4, 2, 5)$.

6. Find parametric equations for the **line** of intersection of the planes $3x - 2y + z = 1$ and $2x + y - 3z = 3$.

7. Find parametric equations for the line through the point $(0, 1, 2)$ that is parallel to the plane $x + y + z = 2$ and perpendicular to the line $x = 1 + t, y = 1 - t, z = 2t$.

8. Which of the following four lines parallel? Are any of them identical?

$$L_1 : x = 1 + 6t, y = 1 - 3t, z = 12t + 5,$$

$$L_2 : x = 1 + 2t, y = t, z = 1 + 4t$$

$$L_3 : 2x - 2 = 4 - 4y = z + 1$$

$$L_4 : \mathbf{r} = \langle 3, 1, 5 \rangle + t \langle 4, 2, 8 \rangle$$

9. Determine whether the planes are parallel, perpendicular, or neither, find the angle between them.

(a) $x + 4y - 3z = 1, -3x + 6y + 7z = 0$

(b) $9x - 3y + 6z = 2, 2y = 6x + 4z$

(c) $x + 2y - z = 2, 2x - 2y + z = 1$

10. (a) Find the distance from the point $(-2, 2, 1)$ to the plane $3x - 5y + z = 5$.

(b) Find the distance between the parallel planes $2x - 3y + z = 4$ and $4x - 6y + 2z = 3$.