

제출 마감일: 2020년 4월 10일 자정까지

제출 방법: '아주Bb/과제출제/제출'에 upload된 과제를 프린트한 후 풀기 =&gt; 풀은 과제를 사진 또는 스캔하여

'아주Bb/과제출제/제출'에 upload =&gt; 이것으로 동영상강의학습활동 출결 인정

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

$$\vec{u} \times \vec{v} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ -1 & 2 & 1 \\ \underline{\quad} & \underline{\quad} & \underline{\quad} \end{vmatrix} = \langle \underline{\quad}, \underline{\quad}, \underline{\quad} \rangle$$

## Section 12.5 Equations of Lines and Planes

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

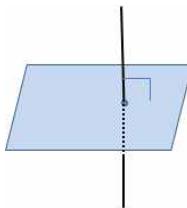
- parametric equations:

- symmetric equation:

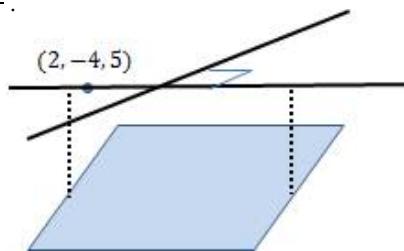
- (b) Find vector equation for the line segment from  $P(1, -2, 3)$  to  $Q(4, 5, 6)$ .

$$\vec{r} = \underline{\quad}$$

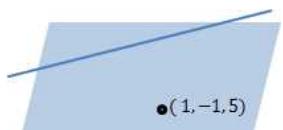
2. Find the symmetric equations of the line through  $(2, -4, 5)$  that is perpendicular to the plane  $3x + y - 2z = 5$ .



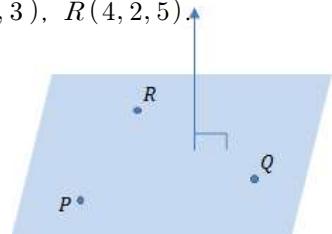
3. Find the symmetric equations of the line through  $(2, -4, 5)$  that is parallel to the plane  $3x + y - 2z = 5$  and perpendicular to the line  $\frac{x+8}{2} = \frac{y-5}{3} = \frac{z-1}{-1}$ .



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  $x = 1 + t, y = 1 - t, z = 2t$ .

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

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

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

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

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

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

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

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  $4x - 6y + 2z = 3$ .