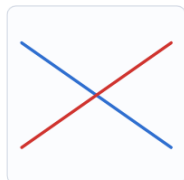


**Determine intersections of lines and planes**

- 1** How many solutions does this system of linear equations have?



A One solution B Infinitely many solutions C Zero solutions

- 2** Find the intersection point of these two lines
 $y = 6x + 7$
 $x = 1$

A	(1, 15)	B	(3, 11)
C	(1, 8)	D	(-3, 11)
E	(1, 9)	F	(1, 13)

- 3** Find the intersection point of these two lines
 $y = -3x - 0$
 $y = 1x + 4$

A	(2, 6)	B	(1, 5)
C	(-1, 3)	D	(-6, 2)
E	(1, 0)	F	(-6, 1)

- 4** Does the given point lie on the line?
 $\vec{r} = \begin{pmatrix} 2 \\ 4 \\ 2 \end{pmatrix} + t \begin{pmatrix} -4 \\ -4 \\ -4 \end{pmatrix}$ Point $(-6, 4, -2)$

A	B
Yes	No

- 5** Does the given point lie on the line through A and B?
A $(1, 0, -4)$ B $(-4, 4, 0)$ Point $(0, 9, 0)$

A	B
Yes	No

- 6** Does the given point lie on the plane?
 $x + 2y - 3z = 5$ Point $(0, -2, -3)$

A	B
No	Yes

- 7** Does the given point lie on the plane?
 $\vec{r} = \begin{pmatrix} 1 \\ 2 \\ 3 \end{pmatrix} + s \begin{pmatrix} -4 \\ 0 \\ -3 \end{pmatrix} + t \begin{pmatrix} 9 \\ -25 \\ -12 \end{pmatrix}$ Point $(-1, 0, 0)$

A	B
No	Yes

- 8** Is the line parallel to the plane?

Plane $-x - y - z = 4$

Line $\vec{r} = \begin{pmatrix} 4 \\ 2 \\ 2 \end{pmatrix} + t \begin{pmatrix} 1 \\ 2 \\ 3 \end{pmatrix}$

A No	B Yes
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**Determine intersections of lines and planes****9**

Does the line lie in the plane?

Plane $3x + z = -3$

Line $\vec{r} = \begin{pmatrix} 0 \\ 3 \\ -3 \end{pmatrix} + t \begin{pmatrix} 1 \\ -2 \\ 2 \end{pmatrix}$

A No

B Yes

10

What is the relationship between the two planes?

$x - 4z = -2$

$-2x - 3y + 4z = -7$

A Neither

B Parallel

C Coincident

D Perpendicular

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Find the direction vector of the line of intersection.

$x - 3y = -4$

$-2y + 3z = 8$

A $\begin{pmatrix} 9 \\ -3 \\ -2 \end{pmatrix}$

B $\begin{pmatrix} 1 \\ -1 \\ -3 \end{pmatrix}$

C $\begin{pmatrix} -9 \\ -3 \\ -2 \end{pmatrix}$

D $\begin{pmatrix} 1 \\ -5 \\ 3 \end{pmatrix}$

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What is the relationship between the plane and the line?

Plane $x + 2y + 3z = 11$

Line $\vec{r} = \begin{pmatrix} 4 \\ -4 \\ 4 \end{pmatrix} + t \begin{pmatrix} 2 \\ -1 \\ 0 \end{pmatrix}$

A Intersects

B Parallel

C Line lies in the plane

13

Find the point where the line meets the plane.

Plane $-3x + 3y - 2z = -3$

Line $\vec{r} = \begin{pmatrix} 3 \\ -2 \\ -2 \end{pmatrix} + t \begin{pmatrix} -3 \\ -1 \\ 1 \end{pmatrix}$

A $(-6, -5, 1)$

B $(3, -2, -2)$

C $(-3, -4, 0)$

D $(0, -3, -1)$

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Find the point of intersection of the two lines.

$\vec{r} = \begin{pmatrix} -1 \\ 4 \\ 3 \end{pmatrix} + t \begin{pmatrix} -3 \\ -2 \\ -2 \end{pmatrix}$

$\vec{r} = \begin{pmatrix} 2 \\ -4 \\ 5 \end{pmatrix} + t \begin{pmatrix} 3 \\ 0 \\ 2 \end{pmatrix}$

A $(-2, -7, 7)$

B $(-1, -4, 3)$

C $(-1, -4, 3)$

D $(-4, -6, 1)$

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What is the relationship between the two lines?

$\vec{r} = \begin{pmatrix} 2 \\ 4 \\ -2 \end{pmatrix} + t \begin{pmatrix} 0 \\ 3 \\ -2 \end{pmatrix}$

$\vec{r} = \begin{pmatrix} 3 \\ 0 \\ -1 \end{pmatrix} + t \begin{pmatrix} 2 \\ -2 \\ 1 \end{pmatrix}$

A Skew

B Coincident

C Parallel

D Intersecting