



Determine whether lines are parallel, intersecting, or skew

1

Does the given point lie on the line?

$$\vec{r} = \begin{pmatrix} -1 \\ -1 \\ -4 \end{pmatrix} + t \begin{pmatrix} 4 \\ -4 \\ 3 \end{pmatrix} \quad \text{Point } (11, -13, 5)$$

A

Yes

B

No

2

Does the given point lie on the line through A and B?

A $(-1, -4, 3)$ B $(-4, 4, -4)$ Point $(-3, 20, -21)$

A

No

B

Yes

3

Find the point of intersection of the two lines.

$$\vec{r} = \begin{pmatrix} -5 \\ -5 \\ 0 \end{pmatrix} + t \begin{pmatrix} -4 \\ -2 \\ -1 \end{pmatrix}$$
$$\vec{r} = \begin{pmatrix} 1 \\ -5 \\ -2 \end{pmatrix} + t \begin{pmatrix} -2 \\ 2 \\ 3 \end{pmatrix}$$

A $(3, -7, -5)$ B $(-1, -3, 1)$ C $(-9, -7, -1)$ D $(-4, -5, 3)$ **4**

Are the two lines skew?

$$\vec{r} = \begin{pmatrix} -4 \\ -3 \\ 1 \end{pmatrix} + t \begin{pmatrix} 3 \\ 0 \\ 1 \end{pmatrix}$$
$$\vec{r} = \begin{pmatrix} 2 \\ -3 \\ 3 \end{pmatrix} + t \begin{pmatrix} 1 \\ -3 \\ -4 \end{pmatrix}$$

A No

B Yes

5

What is the relationship between the two lines?

$$\vec{r} = \begin{pmatrix} -2 \\ -6 \\ 1 \end{pmatrix} + t \begin{pmatrix} 1 \\ -3 \\ -1 \end{pmatrix}$$
$$\vec{r} = \begin{pmatrix} -3 \\ -3 \\ 2 \end{pmatrix} + t \begin{pmatrix} -1 \\ 1 \\ 3 \end{pmatrix}$$

A Coincident B Skew C Parallel D Intersecting

6

Are the two lines skew?

$$\vec{r} = \begin{pmatrix} -1 \\ -1 \\ -3 \end{pmatrix} + t \begin{pmatrix} -4 \\ 2 \\ -4 \end{pmatrix}$$
$$\vec{r} = \begin{pmatrix} 1 \\ 0 \\ 3 \end{pmatrix} + t \begin{pmatrix} 1 \\ -1 \\ 3 \end{pmatrix}$$

A Yes

B No

7

What is the relationship between the two lines?

$$\vec{r} = \begin{pmatrix} -9 \\ 5 \\ -2 \end{pmatrix} + t \begin{pmatrix} -4 \\ 2 \\ -1 \end{pmatrix}$$
$$\vec{r} = \begin{pmatrix} -1 \\ 1 \\ 0 \end{pmatrix} + t \begin{pmatrix} 0 \\ -2 \\ 1 \end{pmatrix}$$

A Coincident B Skew C Parallel D Intersecting

8

Are the two lines skew?

$$\vec{r} = \begin{pmatrix} 4 \\ 3 \\ 3 \end{pmatrix} + t \begin{pmatrix} 1 \\ -1 \\ 4 \end{pmatrix}$$
$$\vec{r} = \begin{pmatrix} 4 \\ 3 \\ 3 \end{pmatrix} + t \begin{pmatrix} -2 \\ 0 \\ 4 \end{pmatrix}$$

A Yes

B No

**Determine whether lines are parallel, intersecting, or skew****9**

What is the relationship between the two lines?

$$\vec{r} = \begin{pmatrix} -3 \\ 1 \\ 3 \end{pmatrix} + t \begin{pmatrix} 1 \\ 3 \\ 3 \end{pmatrix}$$
$$\vec{r} = \begin{pmatrix} -1 \\ 7 \\ 9 \end{pmatrix} + t \begin{pmatrix} -1 \\ -3 \\ -3 \end{pmatrix}$$

☐ A Intersecting ☐ B Skew ☐ C Parallel ☐ D Coincident**10**

Are the two lines skew?

$$\vec{r} = \begin{pmatrix} 0 \\ -3 \\ -2 \end{pmatrix} + t \begin{pmatrix} 3 \\ 2 \\ -3 \end{pmatrix}$$
$$\vec{r} = \begin{pmatrix} 3 \\ -3 \\ 1 \end{pmatrix} + t \begin{pmatrix} 6 \\ 4 \\ -6 \end{pmatrix}$$

☐ A Yes ☐ B No**11**

What is the relationship between the two lines?

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

☐ A Coincident ☐ B Skew ☐ C Intersecting ☐ D Parallel**12**

Are the two lines skew?

$$\vec{r} = \begin{pmatrix} 1 \\ 4 \\ -4 \end{pmatrix} + t \begin{pmatrix} 4 \\ -4 \\ -3 \end{pmatrix}$$
$$\vec{r} = \begin{pmatrix} 0 \\ 0 \\ -2 \end{pmatrix} + t \begin{pmatrix} 2 \\ 0 \\ 2 \end{pmatrix}$$

☐ A Yes ☐ B No