

# True or False?

# Intersections of Lines and Planes

For each statement, circle the correct response.

|          |                                                                                                                                                                                                                                               |      |       |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-------|
| <b>1</b> | The line with equation $\mathbf{r} = \begin{pmatrix} -3 \\ 4 \\ 5 \end{pmatrix} + \lambda \begin{pmatrix} -2 \\ 3 \\ 1 \end{pmatrix}$ lies within the plane with equation $\mathbf{r} \cdot \begin{pmatrix} 5 \\ 2 \\ 4 \end{pmatrix} = 13$   | True | False |
| <b>2</b> | The line $\mathbf{r} = \begin{pmatrix} 3 \\ 1 \\ -10 \end{pmatrix} + \lambda \begin{pmatrix} -1 \\ 0 \\ 4 \end{pmatrix}$ and the plane $3x + 7y - 3z = 1$ intersect at the point $(0, 1, 2)$                                                  | True | False |
| <b>3</b> | The line with equation $\frac{x-1}{3} = \frac{y+9}{-4} = \frac{z+2}{5}$ is parallel to the plane with equation $\mathbf{r} \cdot \begin{pmatrix} -2 \\ -1 \\ 1 \end{pmatrix} = 5$                                                             | True | False |
| <b>4</b> | The line with equation $\mathbf{r} = \begin{pmatrix} -3 + \lambda \\ 4 + 3\lambda \\ 5 - \lambda \end{pmatrix}$ is parallel to the plane with equation $5x + y + 8z = 14$                                                                     | True | False |
| <b>5</b> | The line $\frac{x+2}{-2} = y - 4 = \frac{z-3}{-4}$ and the plane $2x - 6y - z = 14$ intersect at the point $(-1, -3, 2)$                                                                                                                      | True | False |
| <b>6</b> | The line with equation $\mathbf{r} = \begin{pmatrix} -2 \\ 2 \\ 7 \end{pmatrix} + \lambda \begin{pmatrix} -1 \\ 5 \\ 2 \end{pmatrix}$ lies within the plane with equation $\mathbf{r} \cdot \begin{pmatrix} -3 \\ -1 \\ 1 \end{pmatrix} = 11$ | True | False |
| <b>7</b> | The line with equation $\mathbf{r} = 3\mathbf{i} + 11\mathbf{j} - \mathbf{k} + \lambda(\mathbf{i} - 4\mathbf{j} - 2\mathbf{k})$ and the plane $x - 3y - 6z = 51$ intersect at the point $(6, -1, -7)$                                         | True | False |