1) A line \( m \) passes through (1, –7) and (6, –2). A line \( n \) passes through (3, –9) and (8, –4). Prove that the lines \( m \) and \( n \) are parallel.

2) A line \( u \) passes through (3, –7) and (5, –4). Slope of a line \( t \) is \(-\frac{2}{3}\). Prove that the lines \( t \) and \( u \) are perpendicular.

3) A line passes through \( A(0, 0) \) and \( B(5, 15) \). Another line passes through \( C(2, –2) \) and \( D(7, 13) \). Is \( \overrightarrow{AB} \) parallel to \( \overrightarrow{CD} \)? Justify.

4) A line passes through \( (–2, 6) \) and \( (1, –6) \). Another line passes through \( (–5, 4) \) and \( (3, 6) \). Prove that the lines are perpendicular?

5) Slope of a line \( p \) is 1. A line \( q \) passes through \( (–1, –8) \) and \( (4, –3) \). Are the lines \( p \) and \( q \) parallel or perpendicular? Justify your answer.
1) A line \( m \) passes through \((1, -7)\) and \((6, -2)\). A line \( n \) passes through \((3, -9)\) and \((8, -4)\). Prove that the lines \( m \) and \( n \) are parallel.

\[
\text{slope of } m = 1 \; ; \; \text{slope of } n = 1 \\
\text{slope of } m = \text{slope of } n \\
\text{The lines } m \text{ and } n \text{ are parallel.}
\]

2) A line \( u \) passes through \((3, -7)\) and \((5, -4)\). Slope of a line \( t \) is \(-\frac{2}{3}\). Prove that the lines \( t \) and \( u \) are perpendicular.

\[
\text{slope of } t = -\frac{2}{3} \; ; \; \text{slope of } u = \frac{3}{2} \\
\text{slope of } t \times \text{slope of } u = -1 \\
\text{The lines } t \text{ and } u \text{ are perpendicular.}
\]

3) A line passes through \( A(0, 0) \) and \( B(5, 15) \). Another line passes through \( C(2, -2) \) and \( D(7, 13) \). Is \( \overrightarrow{AB} \) parallel to \( \overrightarrow{CD} \)? Justify.

\[
\text{slope of } \overrightarrow{AB} = 3 \; ; \; \text{slope of } \overrightarrow{CD} = 3 \\
\text{slope of } \overrightarrow{AB} = \text{slope of } \overrightarrow{CD} \\
\text{Yes. As the slopes are equal, } AB \text{ is parallel to } CD.
\]

4) A line passes through \((-2, 6)\) and \((1, -6)\). Another line passes through \((-5, 4)\) and \((3, 6)\). Prove that the lines are perpendicular?

\[
\text{Slope of a line passing through } (-2, 6) \text{ and } (1, -6) = -4 \\
\text{Slope of a line passing through } (-5, 4) \text{ and } (3, 6) = \frac{1}{4} \\
\text{Product of their slopes equals to } -1, \text{ the lines are perpendicular.}
\]

5) Slope of a line \( p \) is 1. A line \( q \) passes through \((-1, -8)\) and \((4, -3)\). Are the lines \( p \) and \( q \) parallel or perpendicular? Justify your answer.

\[
\text{slope of } p = 1 \; ; \; \text{slope of } q = 1 \\
\text{slope of } p = \text{slope of } q \\
\text{As the slopes are equal, the lines } p \text{ and } q \text{ are parallel.}
\]