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 \(AB\) parallel to \(CD\)? 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.

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

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 \( \overrightarrow{CD} \)?

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

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.

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

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.

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