

Name : \_\_\_\_\_

## Parallel or Perpendicular Lines

Sheet 1

- 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.

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- 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.

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- 3) A line passes through  $A(1, 5)$  and  $B(4, 2)$ . Another line passes through  $C(2, -2)$  and  $D(7, 13)$ . Is  $\overleftrightarrow{AB}$  parallel to  $\overleftrightarrow{CD}$ ?

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- 4) A line passes through  $A(1, 2)$  and  $B(3, 6)$ . Prove that this line is perpendicular to the line passing through  $(-5, 4)$  and  $(1, 2)$ .

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- 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.

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**Parallel or Perpendicular Lines**

- 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.

**slope of  $m = 1$  ; slope of  $n = 1$**

**slope of  $m =$  slope of  $n$**

**The lines  $m$  and  $n$  are parallel.**

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- 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.

**slope of  $t = -\frac{2}{3}$**

**slope of  $t \times$  slope of  $u = -1$**

**The lines  $t$  and  $u$  are perpendicular.**

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- 3) A line passes through  $A(1, 3)$  and  $B(4, 9)$ . Is  $\overleftrightarrow{AB}$  parallel to a line passing through  $C(2, -2)$  and  $D(7, 13)$ . Is  $\overleftrightarrow{AB}$  perpendicular to a line passing through  $E(1, 3)$  and  $F(4, 9)$ ?

**slope of  $\overleftrightarrow{AB} = 3$**

**slope of  $\overleftrightarrow{CD} = 3$**

**Yes. As the slopes are equal, the lines are parallel.**

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- 4) A line passes through  $G(1, 3)$  and  $H(4, 9)$ . Prove that this line is perpendicular to a line passing through  $I(-5, 4)$  and  $J(2, 10)$ .

**Slope of a line  $GH = 3$**

**Slope of a line  $IJ = -\frac{1}{3}$**

**Product of their slopes equals to  $-1$ , the lines are perpendicular.**

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- 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.

**slope of  $p = 1$  ; slope of  $q = 1$**

**slope of  $p =$  slope of  $q$**

**As the slopes are equal, the lines  $p$  and  $q$  are parallel.**

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