

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

## Parallel and Perpendicular Lines

Sheet 4

- 1) Equation of line  $j$  is  $y = -7x + 5$ . Equation of line  $k$  is  $-7y = -x + 14$ . Prove that the lines are perpendicular.

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- 2) Equation of  $\overleftrightarrow{AB}$  is  $y - 6x - 5 = 0$ . Equation of  $\overleftrightarrow{BC}$  is  $2y = 12x + 9$ . Are the lines parallel or perpendicular? Justify your answer.

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- 3) Equation of a line  $l$  is  $3x - 4y + 7 = 0$ . Equation of a line  $m$  is  $6x - 8y + 14 = 0$ . Prove that the lines are parallel.

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- 4) Equation of  $\overleftrightarrow{KL}$  is  $3x - 4y + 7 = 0$ . Equation of  $\overleftrightarrow{OP}$  is  $6x - 8y + 14 = 0$ . Prove that  $\overleftrightarrow{KL} \perp \overleftrightarrow{OP}$ .

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- 5) Equation of the lines are  $9y - 12x + 6 = 0$  and  $-2y = -\frac{8}{3}x + 1$ . Are the lines parallel or perpendicular? Justify.

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**Parallel and Perpendicular Lines**

- 1) Equation of line  $j$  is  $y = -7x + 5$ . Equation of line  $k$  is  $-7y = -x + 14$ . Prove that the lines are perpendicular.

$$\text{slope of } j = -7 ; \text{ slope of } k = \frac{1}{7}$$

$$\text{slope of } j \times \text{slope of } k = -1$$

**The lines  $j$  and  $k$  are perpendicular.**

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- 2) Equation of  $\overleftrightarrow{AB}$  is  $y - 6x - 5 = 0$ . Equation of  $\overleftrightarrow{BC}$  is  $2y = 12x + 9$ . Are the lines parallel or perpendicular? Justify your answer.

$$\text{slope of } \overleftrightarrow{AB} =$$

$$\text{slope of } \overleftrightarrow{BC} =$$

As the slopes

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- 3) Equation of a line  $P$  is  $y = 4x + 5$ . Equation of a line  $Q$  is  $y = 4x + 1$ . Prove that the lines are parallel.

$$\text{slope of } P = 4$$

$$\text{slope of } Q = 4$$

**The lines  $P$  and  $Q$  are parallel.**

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- 4) Equation of  $\overleftrightarrow{KL}$  is  $y = 3x + 2$ . Equation of  $\overleftrightarrow{OP}$  is  $y = -\frac{1}{3}x + 1$ . Prove that  $\overleftrightarrow{KL} \perp \overleftrightarrow{OP}$ .

$$\text{slope of } \overleftrightarrow{KL} = 3$$

$$\text{slope of } \overleftrightarrow{OP} = -\frac{1}{3}$$

**$\overleftrightarrow{KL}$  is perpendicular to  $\overleftrightarrow{OP}$ .**

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- 5) Equation of the lines are  $9y - 12x + 6 = 0$  and  $-2y = -\frac{8}{3}x + 1$ . Are the lines parallel or perpendicular? Justify.

$$\text{slope of } 9y - 12x + 6 \text{ is } \frac{4}{3}$$

$$\text{slope of } -2y = -\frac{8}{3}x + 1 \text{ is } \frac{4}{3}$$

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

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