

Name : _____

Parallel and Perpendicular Lines

Sheet 2

- 1) $(3, 3)$ and $(7, -1)$ are the endpoints of a chord KL. $(3, -5)$ and $(7, -1)$ are the endpoints of a chord MN. Prove that the chords are perpendicular.
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- 2) Equation of a line AB is $y = 7x + 1$. A line CD passes through $(9, -4)$ and $(8, -11)$. Prove that the lines AB and CD are parallel.
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- 3) Slope of a line PQ is $\frac{1}{2}$. Triangle PQR is a right-angled triangle with vertices $P(6, 2)$ and $Q(8, -4)$. Is R on the circle.
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- 4) $L(2, 1)$ is the centre of a circle. Are the line segments LM and LN perpendicular? Answer.
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- 5) The coordinates of S and T are $(8, 9)$ and $(6, 5)$ respectively. Equation of a line UV is $2y = 4x - 16$. Prove that the lines ST and UV are parallel.
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Parallel and Perpendicular Lines

- 1) (3, 3) and (7, -1) are the endpoints of a chord KL. (3, -5) and (7, -1) are the endpoints of a chord MN. Prove that the chords are perpendicular.

$$\text{slope of } \overline{KL} = -1 ; \text{ slope of } \overline{MN} = 1$$

$$\text{slope of } \overline{KL} \times \text{slope of } \overline{MN} = -1$$

The chords are perpendicular.

- 2) Equation of a line AB is $y = 7x + 1$. A line CD passes through (9, -4) and (8, -11). Prove that the lines AB and CD are parallel.

$$\text{slope of } \overrightarrow{AB} = 7$$

$$\text{slope of } \overrightarrow{CD} = 7$$

The lines AB and CD are parallel.

- 3) Slope of a line PQ is $\frac{1}{2}$. A line RQ passes through (6, 2) and (8, -4). Is triangle PQR a right-angled triangle? Justify.

$$\text{slope of } \overline{PQ} = \frac{1}{2}$$

$$\text{slope of } \overline{RQ} = -\frac{3}{2}$$

Yes. Product of slopes is -1.

- 4) L(2, 1) is the center of a circle. M(4, 3) and N(6, 3) are points on the circle. Are the line segments LM and LN perpendicular? Justify.

$$\text{slope of } \overline{LM} = -\frac{1}{2}$$

$$\text{slope of } \overline{LN} = \frac{1}{2}$$

Yes. Product of slopes is -1. Therefore, LM and LN are perpendicular.

- 5) The coordinates of S and T are (8, 9) and (6, 5) respectively. Equation of a line UV is $2y = 4x - 16$. Prove that the lines ST and UV are parallel.

$$\text{slope of } \overrightarrow{ST} = 2 ; \text{ slope of } \overrightarrow{UV} = 2$$

$$\text{slope of } \overrightarrow{ST} = \text{slope of } \overrightarrow{UV}$$

The lines ST and UV are parallel.

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