

Name : _____

Parallel and Perpendicular Lines

Sheet 1

- 1) The coordinates of P and Q are (2, 6) and (4, 5) respectively. Equation of a line RS is $y = 2x - 3$. Prove that the lines PQ and RS are perpendicular.
-

- 2) J(-4, 2) is the center of a circle. K(-1, 5) is any point on the circle. A line $y = x + 9$ is a chord of the circle. Prove that the line segment JK is parallel to the chord.
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- 3) A line ST passes through the points S(2, 3) and T(4, 5). The gradient of line UV is $\frac{1}{5}$. Prove that the lines ST and UV are parallel.
-

- 4) The endpoints of a chord AB are A(2, 3) and B(4, 5). The equation of a line BC is $y = x - 11$. Is triangle ABC a right-angled triangle?
-

- 5) (-9, -6) and (-5, -10) are the endpoints of a chord EF. (-5, -10) and (-1, -6) are the endpoints of a chord GH. Are the chords parallel or perpendicular? Justify.
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Parallel and Perpendicular Lines

- 1) The coordinates of P and Q are (2, 6) and (4, 5) respectively. Equation of a line RS is $y = 2x - 3$. Prove that the lines PQ and RS are perpendicular.

$$\text{slope of } \overrightarrow{PQ} = -\frac{1}{2} ; \text{ slope of } \overrightarrow{RS} = 2$$

$$\text{slope of } \overrightarrow{PQ} \times \text{slope of } \overrightarrow{RS} = -1$$

The lines PQ and RS are perpendicular.

- 2) J(-4, 2) is the center of a circle. K(-1, 5) is any point on the circle. A line $y = x + 9$ is a chord of the circle. Prove that the line segment JK is parallel to the chord.

$$\text{slope of } \overline{JK} = 1$$

$$\text{slope of } y = x + 9 = 1$$

The line segment JK is parallel to the chord.

- 3) A line ST passes through the points S(1, 2) and T(6, 7). A line UV passes through the points U(2, 3) and V(7, 8). Prove that the lines ST and UV are parallel.

$$\text{slope of } \overrightarrow{ST} = \frac{1}{5}$$

$$\text{slope of } \overrightarrow{UV} = \frac{1}{5}$$

The lines ST and UV are parallel.

- 4) The endpoints of a line segment AB are A(1, 2) and B(4, 6). The equation of a line BC is $y = x - 11$. Is triangle ABC a right-angled triangle? Justify.

$$\text{slope of } \overline{AB} = \frac{4}{3}$$

$$\text{slope of } \overline{BC} = 1$$

No. Product of their slopes is not -1.

Triangle ABC is not a right-angled triangle.

- 5) (-9, -6) and (-5, -10) are the endpoints of a chord EF. (-5, -10) and (-1, -6) are the endpoints of a chord GH. Are the chords parallel or perpendicular? Justify.

$$\text{slope of } \overline{EF} = -1 ; \text{ slope of } \overline{GH} = 1$$

$$\text{slope of } \overline{EF} \times \text{slope of } \overline{GH} = -1$$

Product of their slopes equals to -1, the chords are perpendicular.

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