

Name : _____

Parallel and Perpendicular Lines

Sheet 5

- 1) The coordinates of A and B are (1, 3) and (5, 7) respectively. Equation of a line CD is $y = -x + 12$. Prove that the lines AB and CD are perpendicular.

- 2) P(5, 7) is the center of a circle. Q(3, 5) and R(7, 5) are any points on the circle. Are the line segments PQ and PR perpendicular? Justify your answer.

- 3) A line KL passes through M(2, 3) and N(4, 5). Is \overleftrightarrow{KL} parallel to \overleftrightarrow{MN} ?

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Equation of a line is $y = 2x - 11$.

- 4) Equation of a chord of a circle is $2x - 3y + 10 = 0$. Prove that the chord is perpendicular to the radius.

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Equation of a line is $y = 2x - 11$. Points D(-8, -9) and (3, 2).

- 5) The endpoints of a line segment DE are (-8, 7) and (-6, 3). The equation of a line EF is $y = 2x - 11$. Is triangle DEF a right triangle? Justify your answer.

Parallel and Perpendicular Lines

- 1) The coordinates of A and B are (1, 3) and (5, 7) respectively. Equation of a line CD is $y = -x + 12$. Prove that the lines AB and CD are perpendicular.

$$\text{slope of } \overrightarrow{AB} = 1 ; \text{ slope of } \overrightarrow{CD} = -1$$

$$\text{slope of } \overrightarrow{AB} \times \text{slope of } \overrightarrow{CD} = -1$$

The lines AB and CD are perpendicular.

- 2) P(5, 7) is the center of a circle. Q(3, 5) and R(7, 5) are any points on the circle. Are the line segments PQ and PR perpendicular? Justify your answer.

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

$$\text{slope of } \overline{PR} = 0$$

Yes. Product of slopes is 0, so the lines are perpendicular.

- 3) A line KL passes through (1, 2) and (2, 4). Is KL parallel to ML where M(1, 2) and L(2, 4)?

$$\text{slope of } \overrightarrow{KL} = 2$$

$$\text{slope of } \overrightarrow{ML} = 2$$

The lines KL and ML are parallel.

- 4) Equation of a chord of a circle is $y = x - 1$. Prove that the chord is parallel to the chord $y = x - 11$.

$$\text{slope of } y = x - 1 = 1$$

$$\text{slope of chord } y = x - 11 = 1$$

As the slopes are equal, the chords are parallel.

- 5) The endpoints of a line segment DE are (-8, 7) and (-6, 3). The equation of a line EF is $y = 2x - 11$. Is triangle DEF a right triangle? Justify your answer.

$$\text{slope of } \overline{DE} = -2 ; \text{ slope of } \overline{EF} = 2$$

$$\text{slope of } \overline{DE} \times \text{slope of } \overline{EF} = -4 \neq -1$$

No. Product of their slopes are not equal to -1, the triangle DEF is not a right triangle.

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