

Name : _____

Parallel or Perpendicular Lines

Sheet 5

- 1) A line passes through $J(0, -2)$ and $K(5, 1)$. Another line passes through $L(0, 9)$ and $M(5, 12)$. Prove that \overleftrightarrow{JK} and \overleftrightarrow{LM} are parallel.
- _____

- 2) Slope of a line y is $\frac{7}{4}$. A line z passes through $(-4, 2)$ and $(4, 16)$. Are the lines y and z parallel or perpendicular? Justify.
- _____

- 3) A line t passes through $(-2, 3)$ and $(4, 1)$. A line u passes through $(-1, 2)$ and $(3, 0)$. Prove that the lines t and u are perpendicular.
- _____

- 4) A line passes through $X(2, 3)$ and $Z(-6, -5)$. Prove that the line is perpendicular to the line that passes through $Y(-8, 0)$ and $(-2, 4)$.
- _____

- 5) Slope of a line m is 1. A line n passes through $(3, -4)$ and $(4, -5)$. Are the lines m and n parallel or perpendicular? Justify.
- _____

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Parallel or Perpendicular Lines

- 1) A line passes through $J(0, -2)$ and $K(5, 1)$. Another line passes through $L(0, 9)$ and $M(5, 12)$. Prove that \overleftrightarrow{JK} and \overleftrightarrow{LM} are parallel.

$$\text{slope of } \overleftrightarrow{JK} = \frac{3}{5}; \text{ slope of } \overleftrightarrow{LM} = \frac{3}{5}$$

$$\text{slope of } \overleftrightarrow{JK} = \text{slope of } \overleftrightarrow{LM}$$

\overleftrightarrow{JK} and \overleftrightarrow{LM} are parallel.

- 2) Slope of a line y is $\frac{7}{4}$. A line z passes through $(-4, 2)$ and $(4, 16)$. Are the lines y and z parallel or perpendicular? Justify.

$$\text{slope of } y = \frac{7}{4};$$

$$\text{slope of } z = \frac{16 - 2}{4 - (-4)} = \frac{14}{8} = \frac{7}{4}$$

As the slopes are equal,

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- 3) A line t passes through $(-2, 1)$ and $(2, 5)$. A line u passes through $(-1, 2)$ and $(1, -2)$. Prove that the lines t and u are perpendicular.

$$\text{slope of } t = \frac{4}{4} = 1;$$

$$\text{slope of } u = \frac{-4}{2} = -2$$

Product of the slopes is $1 \times -2 = -2$.

4. Prove that the lines

are **perpendicular**.

- 4) A line passes through $W(-2, 3)$ and $X(1, 5)$. Another line passes through $Y(-8, 0)$ and $Z(-6, -5)$. Prove that the lines WX and YZ are parallel.

$$\text{slope of } \overleftrightarrow{WX} = \frac{5 - 3}{1 - (-2)} = \frac{2}{3}$$

$$\text{slope of } \overleftrightarrow{YZ} = \frac{-5 - 0}{-6 - (-8)} = \frac{-5}{-2} = \frac{5}{2}$$

\overleftrightarrow{WX} is parallel to \overleftrightarrow{YZ} .

- 5) Slope of a line m is 1. A line n passes through $(3, -4)$ and $(4, -5)$. Are the lines m and n parallel or perpendicular? Justify.

$$\text{slope of } m = 1; \text{ slope of } n = -1$$

$$\text{slope of } m \times \text{slope of } n = -1$$

Product of their slopes equals to -1 , the lines m and n are perpendicular.