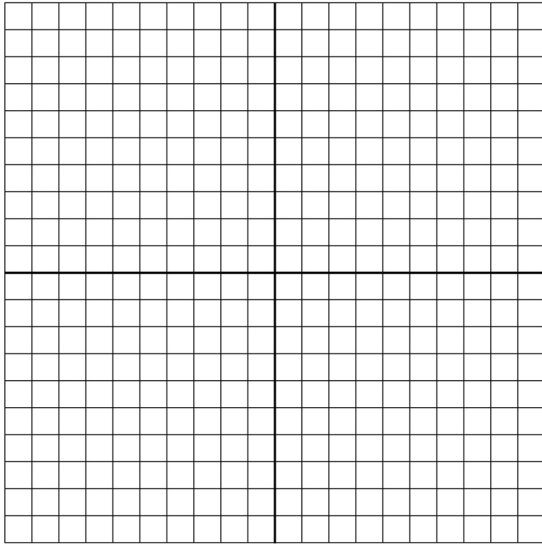


Determine the line equation of a perpendicular bisector



$\triangle MNP$ is defined by points $M(-5,3)$, $N(4,6)$, and $P(1,-1)$. If R is the midpoint of \overline{MP} , find the line equation of perpendicular bisector \overline{RT} .

1. Plot the points of the triangle.
2. Find R , the midpoint of \overline{MP} , by using the midpoint formula.

$M(-5,3)$ and $P(1,-1)$

$$\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

$$\left(\frac{-5 + 1}{2}, \frac{3 + -1}{2} \right)$$

$$\left(\frac{-4}{2}, \frac{2}{2} \right)$$

$R(-2, 1)$

3. Find the slope of \overline{MP} .
 $M(-5,3)$ and $P(1,-1)$

$$\frac{y_2 - y_1}{x_2 - x_1}$$

$$\frac{-1 - 3}{1 - -5} = \frac{-4}{6} = -\frac{2}{3}$$

3. Find the slope perpendicular to the slope of \overline{MP} .

$$\begin{array}{ccc} \text{slope of } \overline{MP} & \xrightarrow{\text{negative reciprocal}} & \text{slope of } \overline{RT} \\ -\frac{2}{3} & & \frac{3}{2} \end{array}$$

4. Use the slope of \overline{RT} and point $R(-2,1)$ in point-slope form.

$$y - y_1 = m(x - x_1)$$

$$y - 1 = \frac{3}{2}(x + 2)$$

5. Convert to slope-intercept form.

$$y - 1 = \frac{3}{2}(x + 2)$$

$$y - 1 = \frac{3}{2}x + 3$$

$$+ 1 \qquad + 1$$

$$y = \frac{3}{2}x + 4$$