Exercise 10

For the following exercises, determine whether the lines given by the equations below are parallel, perpendicular, or neither parallel nor perpendicular:

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

$$3x + 2y = 1$$

Solution

Solve the given equations for y.

$$\begin{cases} y = \dfrac{2}{3}x + 1 \\ 2y = -3x + 1 \end{cases}$$

$$\begin{cases} y = \dfrac{2}{3}x + 1 \\ y = -\dfrac{3}{2}x + \dfrac{1}{2} \end{cases}$$

The lines are perpendicular because the slopes $(2/3$ and $-3/2)$ are negative reciprocals.