

Instructions: Show all work. Answers without work will not receive full credit. Give exact answers unless specifically asked to round.

1. Find the slope of the line connecting the following pairs of points.

a. $(-3,2), (3,5)$

$$m = \frac{5-2}{3-(-3)} = \frac{3}{6} = \frac{1}{2}$$

b. $(0,1), (0,4)$

$$m = \frac{4-1}{0-0} \text{ undefined}$$

c. $(\frac{1}{4}, -\frac{4}{3}), (-\frac{5}{4}, \frac{1}{3})$

$$m = \frac{\frac{1}{3} - (-\frac{4}{3})}{-\frac{5}{4} - \frac{1}{4}} = \frac{\frac{5}{3}}{-\frac{6}{4}} = \frac{5}{3} \cdot \frac{4}{-6} = \frac{-20}{18} = -\frac{10}{9}$$

d. $(4,-6), (-1,-6)$

$$m = \frac{-6-(-6)}{-1-4} = \frac{0}{-5} = 0$$

2. Find the equation of the line with a slope of $m = \frac{2}{3}$, and a y-intercept of $(0,2)$. Then put the equation in standard form.

$$\left(y = \frac{2}{3}x + 2 \right) \cdot 3$$

$$\begin{array}{r} 3y = 2x + 6 \\ -2x \quad -2x \\ \hline \end{array}$$

$$-2x + 3y = 6 \quad \text{or} \quad 2x - 3y = -6$$

3. Find the equation of the line with a slope of $m = \frac{3}{4}$, and passes through the point $(2,-3)$.

$$\begin{aligned} y &= \frac{3}{4}x + b \\ -3 &= \frac{3}{4}(2) + b \end{aligned}$$

$$\begin{array}{r} -3 = \frac{3}{2} + b \\ -\frac{3}{2} \quad -\frac{3}{2} \\ \hline -\frac{9}{2} = b \end{array}$$

$$y = \frac{3}{4}x - \frac{9}{2}$$

4. On the back of the page, sketch a picture of a line graph with a negative slope, and another with an undefined slope. (You should have two different graphs.)

