1. Suppose that the water level of a river is 34 feet and that it is receding at a rate of 0.5 foot per day. Write an equation for the water level, L, after d days. In how many days will the water level be 26 feet?

m

$y=-0.5x+34$

$L=-0.5d+34$

$26=-0.5x+34$

$-34 \quad -34$

$-8=-0.5x$

$-0.5 \quad -0.5$

$x=16$

2. Seth's father is thinking of buying his son a six-month movie pass for $40. With the pass, matinees cost $1.00. If matinees are normally $3.50 each, how many times must Seth attend in order for it to benefit his father to buy the pass?

$y=1.00x+40$

$3.50x=1.00x+40$

$-1.00x \quad -1.00x$

$\frac{2.50x}{2.5} = \frac{40}{2.5}$

$x = 16$ movies

3. For babysitting, Nicole charges a flat fee of $3, plus $5 per hour. Write an equation for the cost, *C*, after *h* hours of babysitting. What do you think the slope and the y-intercept represent? How much money will she make if she baby-sits 5 hours?

$y=5x+3$

$ per # hrs

$y=5(5)+3$

$y=28$

4. Rufus collected 100 pounds of aluminum cans to recycle. He plans to collect an additional 25 pounds each week. Write and graph the equation for the total pounds, P, of aluminum cans after w weeks. What does the slope and y-intercept represent? How long will it take Rufus to collect 400 pounds of cans?

$y=25x+100$

total lbs

weeks

$400=25x+100$

$-100 \quad -100$

$300=25x$

$x=12$ weeks

5. A canoe rental service charges a $20 transportation fee and $30 dollars an hour to rent a canoe. Write and graph an equation representing the cost, y, of renting a canoe for x hours. What is the cost of renting the canoe for 6 hours?

$y=30x+20$

$y=30(6)+20$

$y=\$200$

6. An attorney charges a fixed fee on $250 for an initial meeting and $150 per hour for all hours worked after that. Write an equation in slope-intercept form. Find the charge for 26 hours of work.

$y=150x+250$

$y=150(26)+250$

7. A water tank already contains 55 gallons of water when Baxter begins to fill it. Water flows into the tank at a rate of 8 gallons per minute. Write a linear equation to model this situation. Find the volume of water in the tank 25 minutes after Baxter begins filling the tank.

$y=8x+55$

$y=8(25)+55$

$y=255$ gal

8. A video rental store charges a $20 membership fee and $2.50 for each video rented. Write and graph a linear equation (y=mx+b) to model this situation. If 15 videos are rented, what is the revenue? If a new member paid the store $67.50 in the last 3 months, how many videos were rented?

$y=2.50x+20$

$67.50=2.50x+20$

$-20.00 \quad -20$

$\frac{47.50}{2.50} = \frac{2.50x}{2.50}$

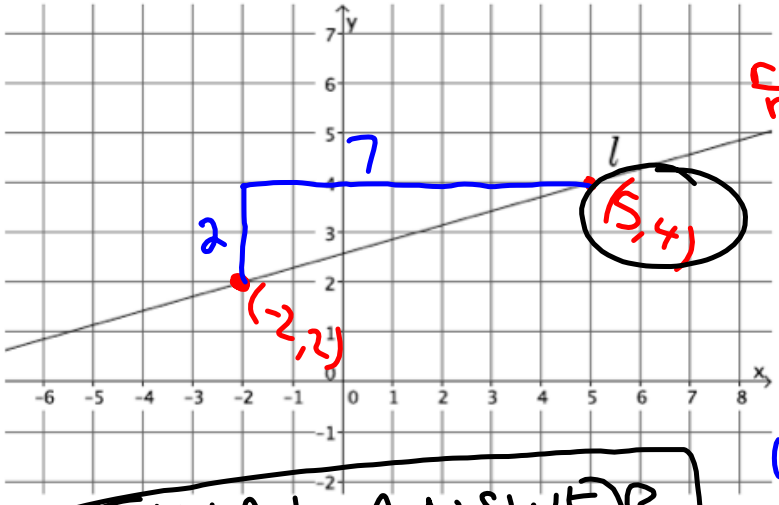
$x=$

Lesson 21: Some Facts About Graphs of Linear Equations in Two Variables

Classwork

Example 1

Let a line l be given in the coordinate plane. What linear equation is the graph of line l?



$y = mx + b$

rise / run $m = \frac{2}{7}$

$b = ?$

Want to find "b" exactly!

FINAL ANSWER

$y = \frac{2}{7}x + 2\frac{4}{7}$

$y = mx + b$ use (5, 4)

$y = \frac{2}{7}x + b$

$4 = \frac{2}{7} \cdot 5 + b$

$4 = \frac{10}{7} + b$

$\frac{28}{7}$

$-\frac{10}{7}$ $-\frac{10}{7}$

$\frac{18}{7} = b$

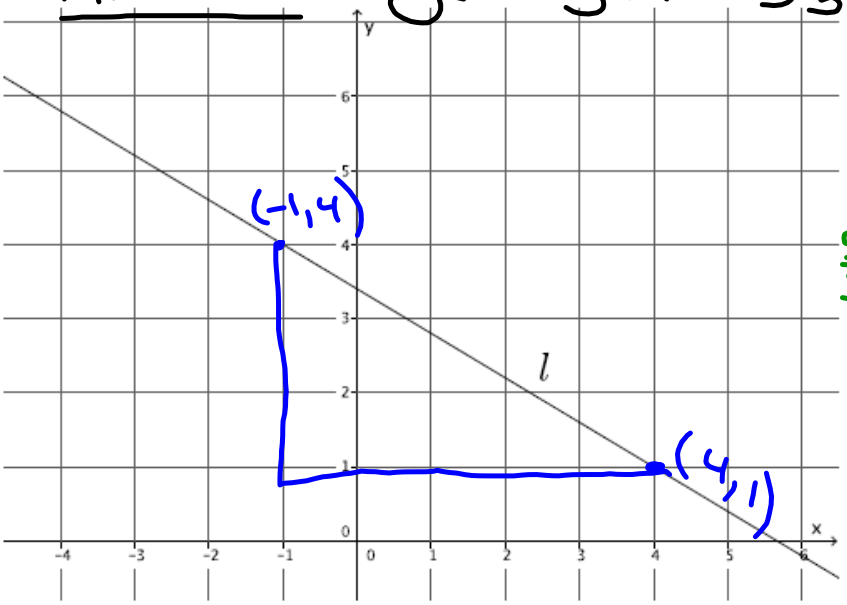
$b = 2\frac{4}{7}$

Example 2

$\frac{-3}{5} \times \frac{4}{1} = \frac{-12}{5}$

Let a line l be given in the coordinate plane. What linear equation is the graph of line l?

ANSWER: $y = \frac{-3}{5}x + 3\frac{2}{5}$



$m = \frac{-3}{5}$

use (4, 1)

$y = mx + b$

$1 = \frac{-3}{5}(4) + b$

$\frac{5}{5}(1) = \frac{-12}{5} + b$

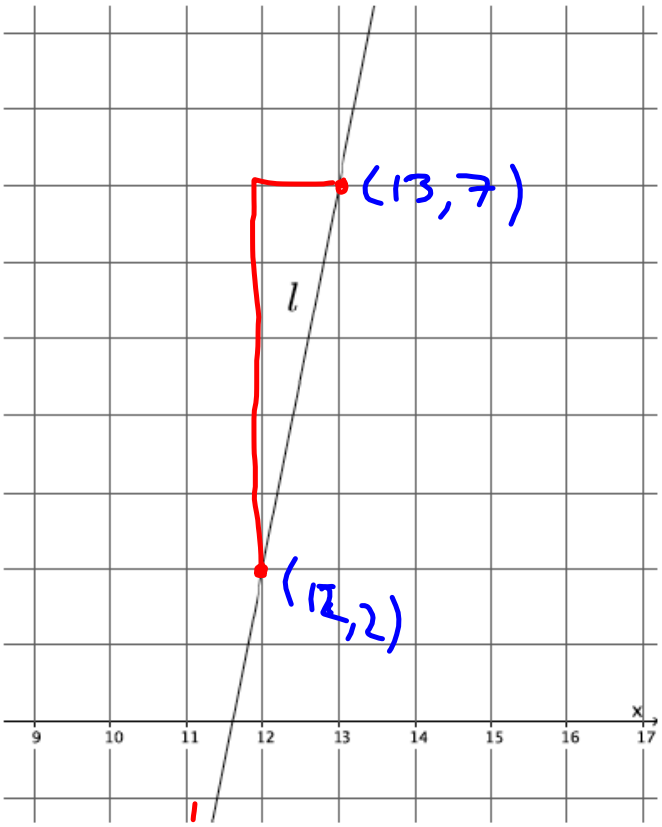
$+\frac{12}{5} \quad +\frac{12}{5}$

$\frac{17}{5} = b$

$b = 3\frac{2}{5}$

Example 3

Let a line l be given in the coordinate plane. What linear equation is the graph of line l?



$m = \frac{5}{1} = 5$

use $(12, 2)$

$y = mx + b$

$2 = 5(12) + b$

$2 = 60 + b$

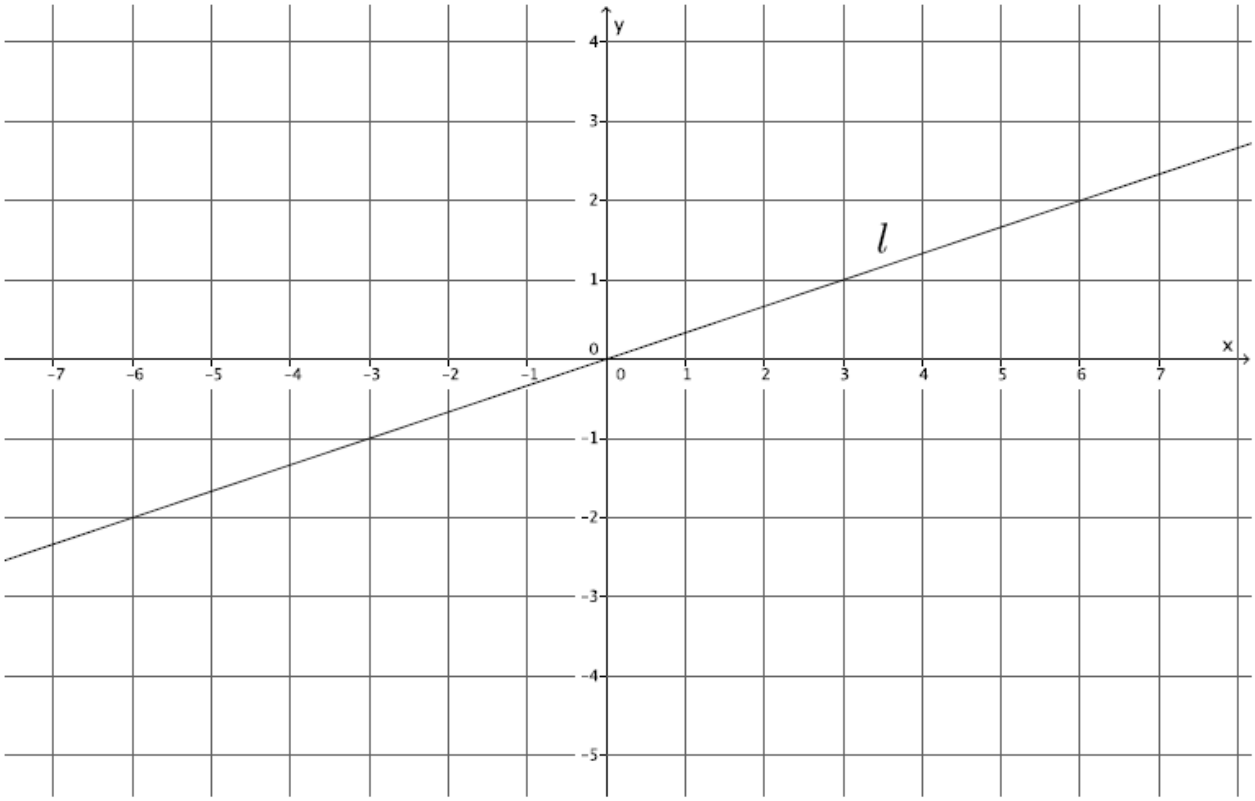
$-60 \quad -60$

$-58 = b$

$y = 5x - 58$

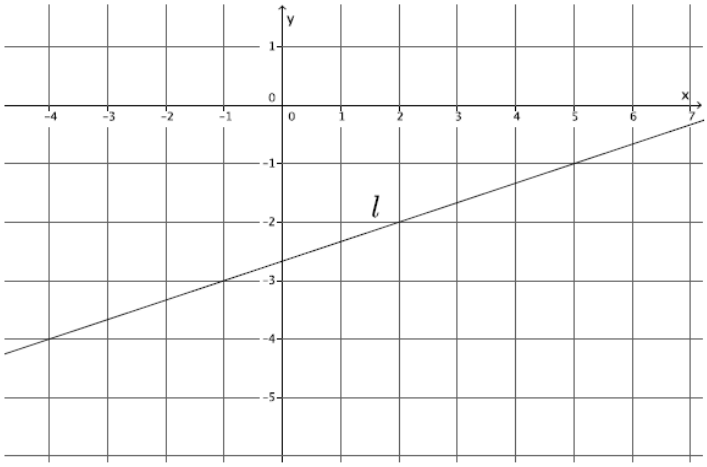
Example 4

Let a line l be given in the coordinate plane. What linear equation is the graph of line l?

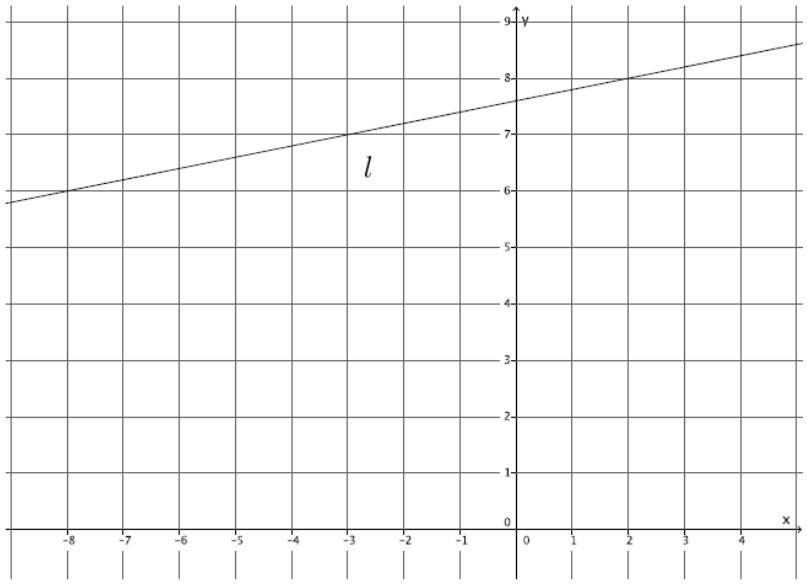


Exercises

1. Write the equation for the line l shown in the figure.

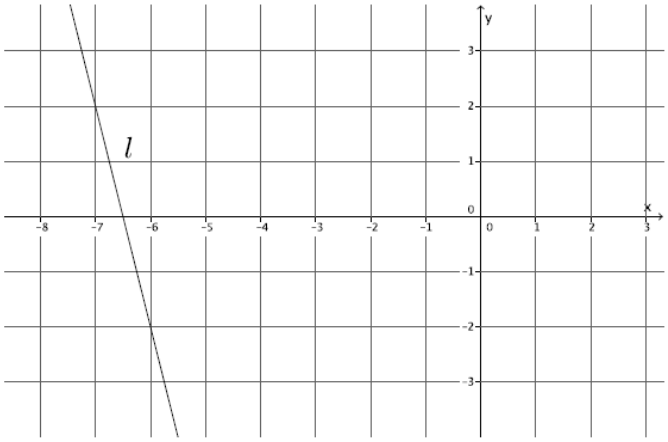


2. Write the equation for the line l shown in the figure.



3. Determine the equation of the line that goes through points $(-4, 5)$ and $(2, 3)$.

4. Write the equation for the line l shown in the figure.



5. A line goes through the point $(8, 3)$ and has slope $m = 4$. Write the equation that represents the line.