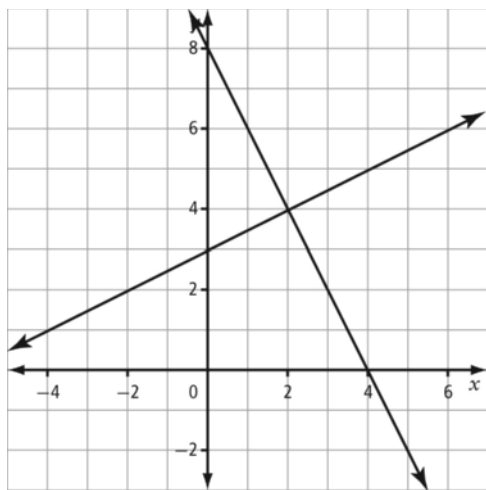


## Chapter 8 Review

### 8.1 Systems of Linear Equations and Graphs

1. Verify, without graphing, whether the given point is a solution for the system of linear equations.
  - a)  $y = 4x + 9$  and  $y = -3x - 5$ ,  $(-2, 1)$
  - b)  $5x - 3y = 17$  and  $2x + 2y = 11$ ,  $(4, 1)$
2. Use technology to solve each system of linear equations. Round your answer to two decimal places, if necessary.
  - a)  $y = \frac{3}{4}x - 3$       b)  $5x + 6y = -35$   
 $y = -\frac{2}{5}x + 1$        $3x + 8y = 10$
3. The lines on the graph form a system of linear equations.
  - a) State the solution of the system.
  - b) Determine the equation of each line in slope-intercept form.

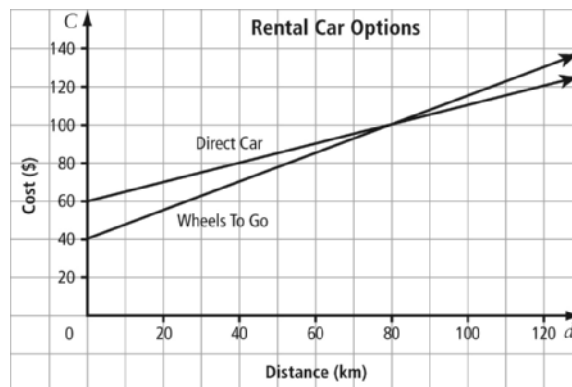


4. A cyclist is riding along a trail. Her distance travelled can be represented by the equation  $d = 20t + 15$ . A second cyclist's distance on the same trail is given by the equation  $d = 25t + 5$ . In both equations,  $d$  is distance, in kilometres, and  $t$  is time, in hours.
  - a) Graph the system using technology to determine the solution for the system of linear equations.

- b) Explain what the solution represents in the context of the situation.

### 8.2 Modelling and Solving Linear Systems

5. Model each situation with a system of linear equations.
  - a) One long distance phone plan charges \$0.50/min with no sign-up fee. A second plan charges a \$25 sign-up fee plus \$0.25/min.
  - b) A box contains 23 coins consisting of dimes and quarters. There is a total of \$3.35 in the box.
  - c) A bus leaves Regina, heading west at 85 km/h. A car leaves Regina 1 h later at 100 km/h, also heading west.
6. Jenny needs to rent a car for the day. The graph shows the daily cost,  $C$ , of renting a vehicle from each of two companies in terms of distance driven,  $d$ , in kilometres.
  - a) How can you use the graph to determine the basic cost of a rental car (excluding distance charges) and the distance charge per kilometre for each company?
  - b) Jenny thinks she will drive about 100 km. Which company should she choose?
  - c) Under what circumstances should Jenny choose DirectCar?
  - d) How does the point of intersection of the lines relate to the decision about which company to choose?



- ★7. A load of  $12.5 \text{ m}^3$  of grain is being dumped from a truck into a bin at a rate of  $1.4 \text{ m}^3$  per minute.

a) Write an equation to express the volume of grain in the truck and a second equation to represent the volume of grain in the bin, both in terms of time. In the equations, let  $V$  represent volume, in cubic metres, and let  $t$  represent time, in minutes.

b) Graph the system of linear equations.

c) Determine the point of intersection and explain its meaning in the context of the problem.

8. A desktop computer begins downloading an 885-megabyte (MB) file at 35 MB/s. At the same time, a laptop begins downloading a 1450 MB file at a rate of 60 MB/s.

a) Create a system of linear equations for the amount,  $A$ , of each file still to be downloaded, in terms of time,  $t$ , in seconds.

b) Graph the equations together and determine the point of intersection of the lines.

c) Explain the meaning of the point of intersection in the context of the downloading of files to the two computers.

9. The sum of Bill's age and Nancy's age is 45. In three years, Bill will be three times as old as Nancy was four years ago.

a) Create a system of linear equations to represent the relationship between Bill's age and Nancy's age.

b) Solve the system graphically to determine how old Bill and Nancy are today.

### 8.3 Number of Solutions for Systems of Linear Equations

10. Predict the number of solutions for each system of linear equations. Justify your answers.

a)  $y = 3x + 7$  and  $y = 3x - 7$

b)  $x - 2y = -5$  and  $4x - 8y = -20$

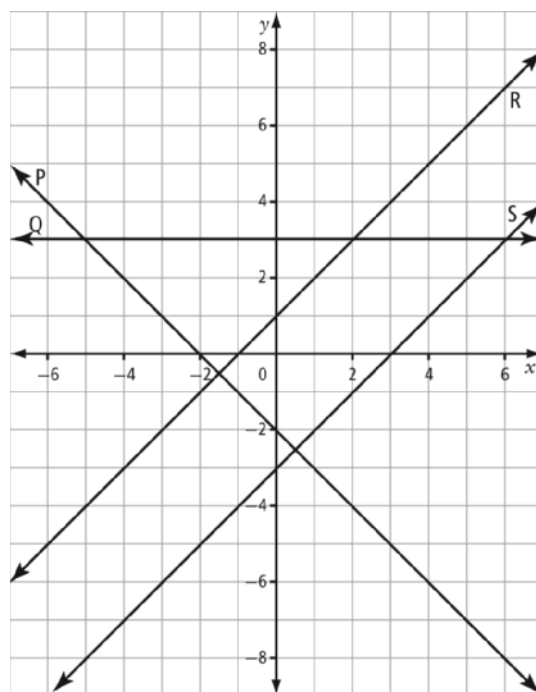
c)  $y = -6x + 1$  and  $y = 6x + 1$

11. Without graphing, determine the number of solutions to the system of linear equations  $2x - 5y = 18$  and  $10y = 4x + 13$ .

12. Which pair(s) of lines in the graph has (have)

a) exactly one solution?

b) no solution?



13. The South Edmonton Pet Shop has several parrots and dogs for sale. There are a total of 24 heads and 82 legs in the display cages.

a) Write a system of linear equations to represent the number of parrots,  $p$ , and the number of dogs,  $d$ , for sale.

b) Determine the solution to this system graphically.

c) Explain why this system of linear equations would have no solution if the total number of legs is changed from 82 to 83.

d) Why is your answer to part c) not related to the slopes of the two lines?