For questions 7–26, model each situation using a linear system. Define two variables and write the equations. You do not have to solve the system now. Keep your answers to the questions, as you will need them in future lessons.

7. The sum of two numbers is 72. Their difference is 48. Find the numbers.

8. A number is four times another number. Six times the smaller number plus half of the larger number equals 212. Find the numbers.

9. Model this situation using a linear system. A server earned $55 in tips, all in loonies and toonies. She had 38 coins altogether. How many toonies were there?

10. Sook-Lee wants to rent a car for a day so she can visit her sister at university. She has called two car-rental agencies. Rent-a-Heap charges $50 per day, plus $0.12/km. Kurt's Rent-a-Car charges $40 per day, plus $0.20/km. At what distance will the cost of renting a car be the same from both companies?

11. Jacques has a total of $155 in $2 and $5 pizza coupons. If he has 40 coupons in all, how many of each kind does he have?

12. The sum of John's age and Margie's age is 36 years. John is four years younger than Margie. How old are John and Margie?

13. Erica's job is to collect money from the pop machines. From one machine she collects a total of 76 dimes and quarters. If the total value is $13, how many dimes and quarters are there?

14. Provincial Express charges $4, plus $1.50/kg, to deliver a package overnight. The Package People charge $5, plus $1/kg. When is Provincial Express less expensive to use?

15. An investment club invested part of $8000 at 10% annual interest and the rest at 12%. If the annual income from these investments is $900, how much was invested at each rate?

16. Rajah earns an hourly wage plus tips. One week he worked 12 h and made a total of $117. The next week he worked 10 h and earned the same amount in tips as the week before, for a total of $110. What is Rajah's hourly wage?

17. A candy store is preparing a mixture of chocolate raisins and chocolate peanuts. The raisins sell for $2.25/kg and the peanuts for $1.75/kg. How much of each type must be mixed to make 20 kg of a mixture that will sell for $41?

18. Raoul drove at a speed of 50 km/h from Ancaster to Oakville. From Oakville to Sudbury, he drove 80 km/h. If the whole trip was 550 km and took 8 h, what is the distance from Oakville to Sudbury?

19. It took the high school hockey team 5 h to travel to a tournament in Thunder Bay. They travelled by bus and plane a total distance of 1320 km. If the bus averaged 40 km/h and the plane averaged 600 km/h, determine the time they spent travelling by plane.

20. A basketball coach bought 20 basketballs for a total of $700. If the practice balls cost $30 and the official balls used for games cost $50, how many of each did the coach buy?

21. Petra won $2000 in a chess competition. She invested part of it at 9% and the remainder at 10%. If the total interest was $191 for the first year, how much was invested at each rate?

22. Twice Sari's age plus half her mother's age is 48. Three times Sari's age less half her mother's age is 27. How old are Sari and her mother?

23. Two different kinds of coffee beans were blended. Individually, they cost $2.30/kg and $3.20/kg. How much of each kind was used if 200 kg of the resulting mixture cost $3/kg?

24. Garry drove to Sarnia. Part of his trip was along major highways and the rest was along country roads. The speed limit is 100 km/h on the highways and 80 km/h on the other roads. He spent a total of 12 h driving 1050 km. How much time did he spend on each type of road?

7. $x + y = 72, x - y = 48$
8. $y = 4x, 6x + \frac{1}{2}y = 212$
9. $x + y = 38, x + 2y = 55$
10. $y = 0.12x + 50, y = 0.2x + 40$
11. $x + y = 40, 2x + 5y = 155$
12. $x + y = 36, x + 4 = y$
13. $x + y = 76, 0.1x + 0.25y = 13$
14. $y = 1.5x + 4, y = x + 5$
15. $x + y = 8000, 0.1x + 0.12y = 900$
16. $12x + y = 117, 10x + y = 110$
17. $x + y = 20, 2.25x + 1.75y = 41$
18. $x + y = 8, 50x + 80y = 550$
19. $x + y = 5, 40x + 600y = 1320$
20. $x + y = 20, 30x + 50y = 700$
21. $x + y = 2000, 0.09x + 0.1y = 191$
22. $2x + \frac{1}{2}y = 48, 3x - \frac{1}{2}y = 27$
23. $x + y = 200, 2.3x + 3.2y = 600$
24. $x + y = 12, 100x + 80y = 1050$