Graph the following linear equations using slope-intercept form.

1. $y=2 x+1$

2. $y=-2 x+1$

3. $y=\frac{2}{5} x-2$

4. $y=3 x-4$

5. $y=-3 x-2$

6. $y=-\frac{3}{4} x-1$

7. $y=\frac{2}{3} x+5$

8. $y=-\frac{1}{3} x+5$

9. $y=-4$

10. $2 x+y=2$

11. $4 x+2 y=6$

12. $-2 x+3 y=12$

13. $-3 x+y=4$

14. $-6 x+3 y=-9$

15. $4 x-2 y=8$

16. $4 x+y=-5$

17. $x+3 y=6$



## Lesson 6.2

Graph the following systems of equations and estimate the solution from the graph.

3. $y=-2 x+3$
$y=\frac{1}{2} x-4$
(2.8, -2.6)

5. $3 y=x+9$
$(-3,2)$

2. $\begin{aligned} & y=2 x+8 \\ & y=x+6\end{aligned} \quad(-2,4)$
$y=x+6$

4. $y=2 x+3$
$(0.5,4)$
$y=4$

6. $4 x+2 y=6$
$(0,3)$


9. $\begin{aligned} & y=-x \\ & y=x+2\end{aligned} \quad(-\mathbf{1}, \mathbf{1})$

11. $4 x+3 y=24$
$2 x-3 y=-6$

8. $-x+3 y=-18(4.8,-4.4)$

10. $x+y=6$
$y=x$
$(3,3)$

12. $\begin{aligned} & x+y=2 \\ & 2 y-x=10\end{aligned} \quad(-2,4)$


15. $\begin{aligned} & y=x+3 \\ & 3 y+x=6\end{aligned}(-0.75,2.25)$

17. $-x+y=-1$
$x-y=1$ Infinite Solutions

14. $y=-4$
$y=-3 x-4$
$(0,-4)$

16. $\begin{array}{r}x+5 y=-5 \\ 3 x-2 y=8\end{array} \approx(1.76,-1.35)$

18. $4 x=2 y-10$


## Lesson 6.3

## Solve the following systems using the substitution method.

1. $\begin{aligned} & 2 x+8 y=12 \\ & x-2 y=0\end{aligned}$
2. $y=5$

$$
\begin{equation*}
2 x-y=9 \tag{7,5}
\end{equation*}
$$

5. $2 x+y=-16$
$x-2 y=-28$
6. $x+y=2$
$-2 x+4 y=-19 \quad(4.5,-2.5)$
7. $2 x+y=4$
$2 y=-4 x+8$
infinite solutions
8. $y=3 x$
$3 x+3 y=4 \quad\left(\frac{1}{3}, 1\right)$
9. $x-3 y=0$
$\frac{1}{3} x+y=2$
10. $x+y=7$
$2 x+y=5$
11. $y=-\frac{1}{2} x+1$
$2 x+3 y=6$
12. $4 y=8$
$2 x+5 y=11$
$\left(\frac{1}{2}, 2\right)$
13. $\quad \begin{aligned} & x+2 y=4 \\ & 3 x-4 y=-3\end{aligned}$
14. $x+y=2$
$x+y=5$
no solution
15. $y=2 x+3$
$y=4 x-1$
16. $\begin{aligned} & 2 x-\frac{1}{3} y=-9 \\ &-3 x+y=15\end{aligned} \quad(-4,3)$
17. $x=2$
$2 x+y=4$
18. $\frac{3}{2} x=2 y$
$y=x-1$
19. $x+2 y=0$
$3 x+4 y=4$
$(4,-2)$
20. $x-4 y=1$
$2 x-8 y=2 \quad$ infinite solutions
21. $x=0$
$3 x-6 y=12 \quad(0,-2)$
22. $2 x-3 y=-24$
$x+\frac{1}{4} y=-5$
23. $x+y=6$
$2 y=-2 x+2 \quad$ no solution
24. $2 x=6 y-14$
$3 y-x=7$
infinite solutions
25. $4 x=3 y+3$

$$
\begin{equation*}
x=2 \tag{5}
\end{equation*}
$$

18. $x-2 y=-1$

$$
\begin{equation*}
3 y=x+4 \tag{5,3}
\end{equation*}
$$

20. $2 y=-6$

$$
\begin{equation*}
x+2 y=-1 \tag{5,-3}
\end{equation*}
$$

22. $x-2 y=3$
$4 x-8 y=12 \quad$ infinite solutions
23. $x=2 y-3$
$x=2 y+4$
no solution
24. $\frac{2}{3} x-2 y=12$
$x=-2 y-2$
$(6,-4)$
25. $x+2 y=7$
$2 x-8 y=8$
( $6, \frac{1}{2}$ )
26. $y=-x+3$
$2 y+2 x=4 \quad$ no solution

Write and solve a system of equations using any method (graphing, elimination, or substitution) for each of the following situations.
31. Leonard sells small watermelons for $\$ 7$ each and large watermelons for $\$ 10$ each. One day the number of small watermelons he sold was fifteen more than the number of large watermelons, and he made a total of $\$ 394$. How many small and how many large watermelons did he sell?

32 small watermelons and 17 large watermelons
32. The perimeter of a rectangle is 28 cm . The length of the rectangle is 2 cm more than twice the width. Find the dimensions of the rectangle.

$$
\text { Length }=10 \mathrm{~cm} \text {; width }=4 \mathrm{~cm}
$$

33. The sum of Julian's and Kira's age is 58 . Kira is fourteen less than twice as old as Julian. What are their ages? Julian is 24 years old and Kira is 34 years old
34. A $3 \%$ solution of sulfuric acid was mixed with an $18 \%$ solution of sulfuric acid to produce an $8 \%$ solution. How much $3 \%$ solution and how much $18 \%$ solution were used to produce 15 L of $8 \%$ solution?

10 L of the $3 \%$ solution and 5 L of the $18 \%$ solution
35. Supplementary angles are two angles whose measures have the sum of 180 degrees. Angles $X$ and $Y$ are supplementary, and the measure of angle $X$ is 24 degrees greater than the measure of angle $Y$. Find the measures of angles $X$ and $Y$.

$$
\text { Measure of angle } X=102^{\circ} \text {; measure of angle } Y=78^{\circ}
$$

36. At the end of the 2000 baseball season, the New York Yankees and the Cincinnati Reds had won a total of 31 World Series. The Yankees had won 5.2 times as many World Series as the Reds. How many World Series did each team win?

$$
\text { Yankees won } 26 \text { World Series and Reds won } 5 \text { World Series }
$$

37. Peanuts worth $\$ 2.25$ a pound were mixed with cashews worth $\$ 3.25$ a pound to produce a mixture worth $\$ 2.65$ a pound. How many pounds of each kind of nuts were used to produce 35 pounds of the mixture?

21 pounds of peanuts and 14 pounds of cashews
38. Ernesto spent a total of $\$ 64$ for a pair of jeans and a shirt. The jeans cost $\$ 6$ more than the shirt. What was the cost of the jeans?

Jeans cost $\$ 35$; shirt cost $\$ 29$
39. The perimeter of a rectangular garden is 68 feet. The length of the garden is 4 more than twice the width. What are the dimensions of the garden?

$$
\text { Length }=24 \text { feet } ; \text { width }=10 \text { feet }
$$

40. The Future Teachers of America Club at Paint Branch High School is making a healthy trail mix to sell to students during lunch. The mix will have three times the number of pounds of raisins as sunflower seeds. Sunflower seeds cost $\$ 4.00$ per pound, and raisins cost $\$ 1.50$ per pound. If the group has $\$ 34.00$ to spend on the raisins and sunflower seeds, how many pounds of each should they buy?

12 pounds of raisins and 4 pounds of sunflower seeds

## Lesson 6.4

## Solve the following systems using the elimination method.

1. $x+y=1$
$x-y=5$
$(3,-2)$
2. $\quad \begin{array}{r}2 x+3 y=7 \\ -2 x+y=5\end{array}$
$-2 x+y=5$
3. $\quad \begin{aligned} \frac{1}{2} x+3 y & =1 \\ 3 x+3 y & =6\end{aligned}$
$3 x+3 y=6$
4. $\quad \begin{aligned} x+y & =-3 \\ x-y & =1\end{aligned}$
$(-1,-2)$
5. $\frac{1}{5} x+2 y=-10$
$2 x+2 y=-10$
$(0,-5)$
6. $-4 x=4$
$4 x-3 y=-10 \quad(-1,2)$
7. $x=1$
$6 x-5 y=11$
$(1,-1)$
8. $x-2 y=5$
$3 x-2 y=9$
$\left(2,-\frac{3}{2}\right)$
9. $3 x+y=5$
$2 x+y=10$
10. $3 x+\frac{3}{2} y=6$
$3 x-2 y=-1$
11. $4 x-3 y=12$
$\frac{2}{3} x+2 y=12$
12. $3 y=6$
$4 x-y=-2$
13. $x+y=4$
$2 x+2 y=8$
infinite solutions
14. $x+3 y=12$
$2 x-3 y=12$
$\left(8, \frac{4}{3}\right)$
15. $5 x+4 y=-3$
$10 x-2 y=-3 \quad\left(-\frac{9}{25},-\frac{3}{10}\right)$
16. $4 x-7 y=10$
$3 x+2 y=-7 \quad(-1,-2)$
17. $3 x-4 y=-10$
$5 x+8 y=-2$
$(-2,1)$
18. $4 x+\frac{3}{2} y=17$
$6 x+5 y=20$
$(5,-2)$
19. $-5 x+3 y=6$
$x-y=4$
$(-9,-13)$
20. $3 x+y=2$
$6 x+3 y=5$
$\left(\frac{1}{3}, 1\right)$
21. $x+y=2$
$2 x+2 y=8$
no solution
22. $2 x+3 y=10$
$5 x+7 y=24$
23. $5 x-4 y=-8$
$3 x+8 y=3$
$\left(-1, \frac{3}{4}\right)$
24. $\frac{1}{2} x-3 y=-4$
$4 y=8$
25. $4 x+3 y=19$
$3 x-4 y=8$
26. $3 x+4 y=-25$
$2 x=-6$
$(-3,-4)$

Write and solve a system of equations using any method (graphing, elimination, or substitution) for each of the following situations.
31. The sum of two numbers is 82 and their difference is 26 . Find each of the numbers.

54 and 28
32. Kathryn buys 8 cups of coffee and 2 bagels one day and pays $\$ 31$. Harry buys 3 cups of coffee and 3 bagels the same day and pays $\$ 17.25$. How much is each cup of coffee and each bagel?
$\$ 3.25$ for each cup of coffee and $\$ 2.50$ for each bagel
33. Farmer Deanna looks out her window and counts a total of 64 legs on a total of 20 animals. If she has only sheep and chickens, how many of each does she have? (Hint: Sheep have 4 legs each and chickens 2 legs each.)

12 sheep and 8 chickens
34. Tyler and Pearl went on a 20-kilometer bike ride that lasted 3 hours. Because there were so many steep hills on the bike ride, they had to walk for most of the trip. Their walking speed was 4 kilometers per hour. Their riding speed was 12 kilometers per hour. How much time did they spend walking?

2 hours walking and 1 hour riding
35. A used book store also started selling used CDs and videos. In the first week, the store sold 40 used CDs and videos at $\$ 4.00$ per CD and $\$ 6.00$ per video. The sales for both CDs and videos totaled $\$ 180.00$. How many CDs and videos did the store sell in the first week?

30 CDs and 10 videos
36. A metal alloy is $25 \%$ copper. Another metal alloy is $50 \%$ copper. How much of each alloy should be used to make 1000 grams of a metal alloy that is $45 \%$ copper?

200 grams of the $25 \%$ copper metal alloy and 800 grams of the $50 \%$ copper metal alloy
37. Dried apricots worth $\$ 3.25$ a pound were mixed with dried prunes worth $\$ 4.75$ a pound to produce a mixture of dried fruit worth $\$ 3.79$ a pound. How much of each kind of fruit was used to produce 25 pounds of mixture?

16 pounds of apricots and 9 pounds of prunes
38. One number added to twice another number is 23 . Four times the first number added to twice the other number is 38 . What are the numbers?

$$
5 \text { and } 9
$$

39. The owners of the River View Restaurant have hired enough servers to handle 17 tables of customers, and the fire marshal has approved the restaurant for a limit of 56 customers. How many two-seat and how many four-seat tables should the owners purchase?

6 two-seat tables and 11 four-seat tables
40. The Rodriguez family and the Wong family went to a brunch buffet. The restaurant charges one price for adults and another price for children. The Rodriguez family has two adults and three children, and their bill was $\$ 40.50$. The Wong family has three adults and one child, and their bill was $\$ 38.00$. Determine the price of the buffet for an adult and the price for a child.

$$
\text { Adult price }=\$ 10.50 \text { and child price }=\$ 6.50
$$

## Lesson 6.5

Decide if the following systems of equations have a single solution, no solutions, or infinite solutions. If it has a solution, solve the system.

1. $x+y=1$
$x+y=5 \quad$ no solution
2. $\frac{1}{2} x+3 y=1$
$x+6 y=2$ infinite solutions
3. $2 y=6$
$3(x+y)=12$ single solution; $(1,3)$
4. $x+5 y=9$
$x+5 y=6$ no solution
5. $x+\frac{3}{5} y=2$
$y=-2 x+3$ single solution; $(-1,5)$
6. $3 x+y=5$
$y=-3 x+5$ infinite solutions
7. $2 x+y=4$
$y-5=-2 x$ no solution
8. $7 x+5 y=3$
$5 y-3=-7 x$ infinite solutions
9. $4 x=4$
$2 x+2 y=4 \quad$ single solution; $(1,1)$
10. $x+4 y=2$
$2(x+4 y)=10$ no solution
11. $\quad \begin{aligned} 2 x+3 y & =7 \\ 4 x+5 y & =13\end{aligned}$
$4 x+5 y=13$
single solution; $(2,1)$
12. $x+\frac{1}{3} y=-10$
$3 x+y=30$
no solution
13. $x+y=2$
$3 x+3 y=6$
infinite solutions
14. $2 y=5$
$4 y=15 \quad$ no solution
15. $3 x+y=10$
$y-10=-3 x \quad$ infinite solutions
16. $6 x+4 y=10$
$3 y-10=-7 x \quad$ single solution; $(1,1)$
17. $5 x-4 y=3$
$5 x=4 y-3 \quad$ no solution
18. $\frac{2}{3} x-y=0$
$2 x=3 y \quad$ infinite solutions
19. $x=2$

$$
2(x+y)=4 \quad \text { single solution; }(2,0)
$$

20. $10 x=10-2 y$
$5 x+y=5 \quad$ infinite solutions

## Write a system of equations for each situation and solve using inspection.

21. The sum of two numbers is 100 . Twice the first number plus twice the second number is 200 . What are the numbers? infinite solutions
22. The perimeter of a rectangle is 40 in . Twice the length of the rectangle is 20 minus twice the width. What are the length and width? no solution
23. Coffee worth $\$ 2.95$ a pound was mixed with coffee worth $\$ 3.50$ a pound to produce a blend worth $\$ 3.30$ a pound. How much of each kind of coffee was used to produce 44 pounds of blended coffee?

28 pounds of coffee worth $\$ 2.95$ and pound and 16 pounds of coffee worth $\$ 3.50$ a pound
24. Jeri has a total of 40 pets with a total of 160 legs. If she owns only cats and dogs, how many of each does she have? infinite solutions
25. Pam's age plus Tom's age is 65 . Twice Pam's age is equal to 130 minus twice Tom's age. How old are they? infinite solutions
26. The sum of two numbers is 50 . Three times the first number minus three times the second number is 30 What are the numbers? 30 and 20
27. The perimeter of a rectangle is 30 cm . Four times the length of the rectangle is equal to 120 minus four times the width. What are the length and width? no solution
28. A customer bought six cups of coffee and four bagels and paid $\$ 10$. Another customer bought three cups of coffee and two bagels and paid $\$ 15$. How much are each cup of coffee and each bagel? no solution
29. A family went to Six Flags and bought two adult tickets and five child tickets and paid $\$ 160$. A second family bought two adult tickets and eight child tickets and paid $\$ 220$. How much is each adult ticket and each child ticket? \$20 per child, \$30 per adult
30. Jorge bought two T-shirts and four hoodies for the CMS Student Council for $\$ 80$. Xavier bought one Tshirt and two hoodies for $\$ 40$. How much is each T-shirt and each hoodie? infinite solutions

