Stockton Unified School District

Since 1852

Algebra 1

Week # 2

3-1 Additional Practice

Relations and Functions
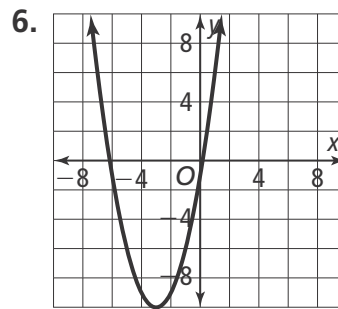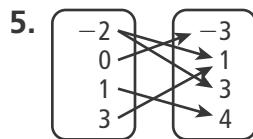
What is the domain and range of each function?

1.
x	3	5	7	8	11
y	6	7	7	9	14

2.
x	−3	−1	2	5	7
y	9	5	4	−5	−7

Is each relation a function? If so, state whether it is one-to-one or many-to-one.

3. {(–4, 7), (–3, 5), (1, 4), (3, –8), (5, –11)}

4. {(–4, 8), (–2, 4), (0, 1), (2, 4), (4, 8)}

5.

6.

7. Explain how the vertical line test proves that a relation is not a function.

8. Fiona buys different amounts of gas at $2.25. She has a graph which shows the different amounts she should pay. What constraints are there on the domain of the function?

3-2 Additional Practice

Linear Functions
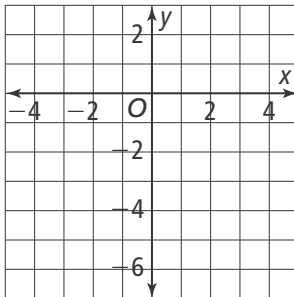
What is the value of $f(-3)$ for each function?

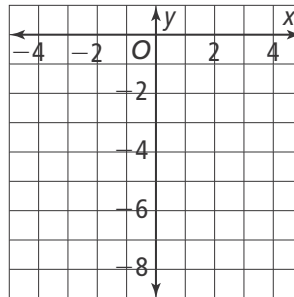**1.** $f(x) = 4x - 9$

2. $f(x) = -\frac{1}{3}x + 13$

3. $f(x) = -2x - 11$

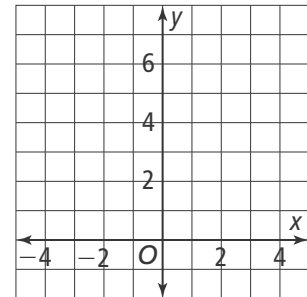**Draw the graph of each linear function.**

4. $f(x) = 3x - 6$

5. $f(x) = -2(x + 4)$

6. $f(x) = \frac{1}{2}x + 5$

Use the data in each table to write a linear function using function notation.

7.

x	y
−3	−0.6
1	0.2
7	1.4

8.

x	y
−5	−10
−2	−1
4	17

9.

x	y
−5	8
−2	2
8	−18

10. A function, $f(x) = 4x + 5$, has a domain $0 \leq x \leq 50$. What is its range?

11. For a basic subscription, a cable television provider charges an activation fee of $60, plus $125 per month. What linear function represents the total cost of a basic cable subscription for t months? What is the total cost for two years of service?

3-3 Additional Practice

Transforming Linear Functions

Suppose $f(x) = 3x + 5$. Describe how the graph of each function compares to f.
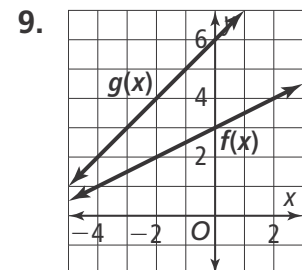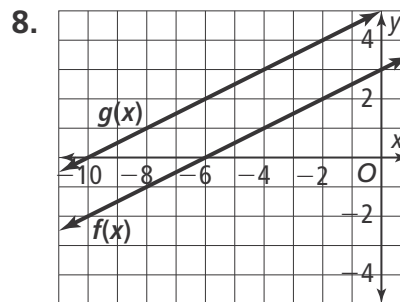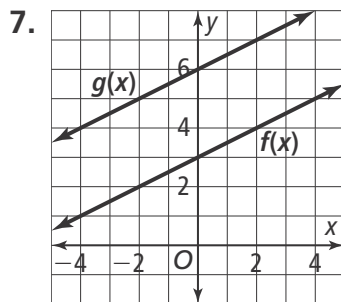
1. $g(x) = f(x) + 12$ **2.** $h(x) = f(x) - 7$ **3.** $g(x) = f(x + 8)$

4. $h(x) = f(x - 14)$ **5.** $g(x) = 4f(x)$ **6.** $g(x) = f(5x)$

What value of k transforms the graph of $f(x) = 0.5x + 3$ into graph g? Describe the transformation.

7.

8.

9.

10. When $-1 < k < 1$, describe the effect of k on $f(kx)$ and $kf(x)$.

11. An athletic club has an application fee of $25 and a monthly membership fee of $15. The function f models the total cost of a membership for x months. The function g represents the cost of the membership if the application fee is waived. Write each function and compare the slopes and y-intercepts of the functions.

3-4 Additional Practice

Arithmetic Sequences

Tell whether or not each sequence is an arithmetic sequence. If it is an arithmetic sequence, give the common difference.

1. 4, 8, 12, 16, …   **2.** −11, 5, 0, 6, …   **3.** 12, 23, 34, 45, …

Write a recursive formula and an explicit formula for each arithmetic sequence.

4. 9, 15, 21, 27, …   **5.** 1.5, 2.25, 3, 3.75, …   **6.** 7, 0, −7, −14, …

Recursive: Recursive: Recursive:

Explicit: Explicit: Explicit:

Write an explicit formula for each recursive formula and a recursive formula for each explicit formula.

7. $a_1 = 5$

$a_n = a_{n-1} + 3$

8. $a_1 = -8$

$a_n = a_{n-1} - 3$

9. $a_n = 15 + 4n$

10. You are given the first four terms of an arithmetic sequence. Why might you use a recursive formula? Why might you use an explicit formula? Under what conditions might a recursive formula be preferred over the explicit formula? Under what conditions might an explicit formula be preferred over the recursive formula?
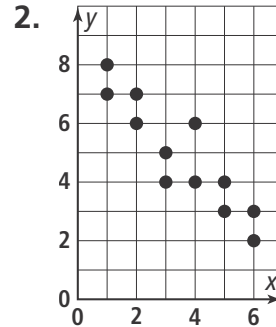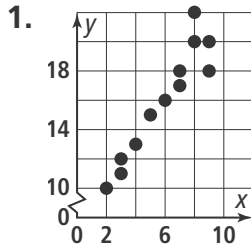
11. You open a savings account with a $400 deposit. Each month after that, you deposit $25. Write an explicit rule to represent the amount of money you deposit into your savings account. How much money will you have in the account on month 12?
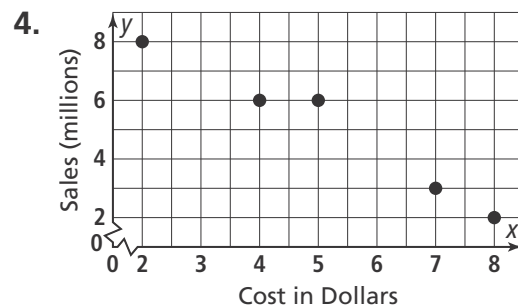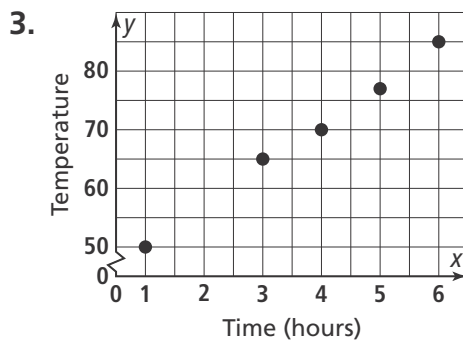
3-5 Additional Practice

Scatter Plots and Lines of Fit

What is the association between the *x*- and *y*-values for each graph?

1.

2.

Describe the type of correlation each scatter plot shows. Draw a trend line that models each data set and find the equation of that trend line.

3.

4.

5. For the trend line in Item 3, what would the expected temperature be after 2 hours? Explain what this means in the context of the data.

6. For the trend line in Item 4, what would the expected sales be if the cost was set at $6.50? Explain what this means in the context of the data.

7. Would you expect the trend line for the temperature to continue in the same direction indefinitely? Explain.

3-6 Additional Practice

Analyzing Lines of Best Fit

Describe the type of correlation indicated by each correlation coefficient.

1. $r = 0.875$ **2.** $r = -0.976$ **3.** $r = 0.043$

For each situation described given a linear model, is there a correlation? If so, is there a causal correlation? Explain.

4. the number of minutes studied for a test and the final test grade

5. the attendance at a baseball game and number of runs the home team scores in the game

Use the table for Items 6 and 7.

Years Since 2002	0	1	3	5	6	7	9	10	12	13
Gross Revenue (Millions)	900	1,900	3,200	4,500	5,150	6,750	7,550	8,100	9,525	10,300

6. What is the equation of the line of best fit for the above data? Round the slope and *y*-intercept to the nearest hundredth. Interpret the slope and *y*-intercept.

7. Use the line of best fit to determine the predicted gross revenue for 2010 and 2018.

8. Explain why a pattern in a residual plot can suggest that a linear model may not be a good fit for a set of data.
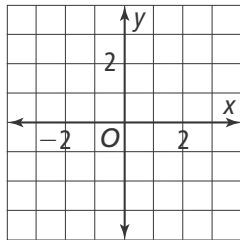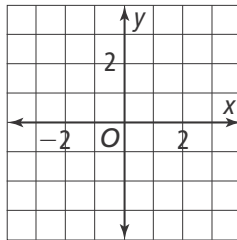
4-1 Additional Practice

Solving Systems of Equations by Graphing

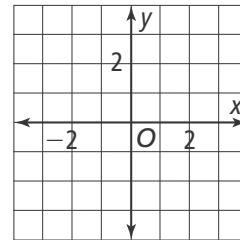**Use a graph to solve each system of equations. List the solution.**

1. $\begin{cases} y = 2x - 1 \\ y = -4x - 7 \end{cases}$

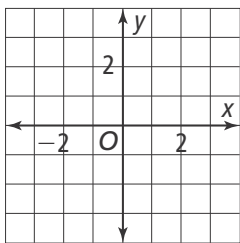**2.** $\begin{cases} 18x - 3y = 21 \\ y = 6x - 7 \end{cases}$

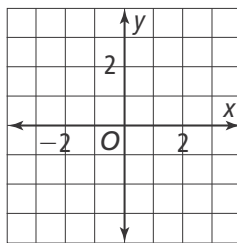**3.** $\begin{cases} y = 6x + 4 \\ 6x - y = 1 \end{cases}$

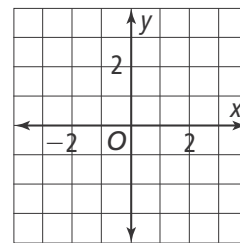**Use a graph to approximate the solution of each system. List the estimated solution.**

4. $\begin{cases} y = 5x - 3 \\ y = -3x + 4 \end{cases}$

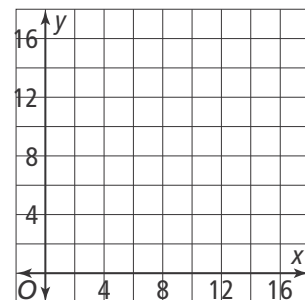**5.** $\begin{cases} y = 4x - 3 \\ y = 8x - 5 \end{cases}$

6. $\begin{cases} y = -3x + 7 \\ x - 2y = -6 \end{cases}$

7. Can there be more than one point of intersection between the graphs of two linear equations? Explain.

8. Elena and Marcus jog after school each day. One day, Elena and Marcus jogged a total of 15 miles. Elena jogged 1 mile more than Marcus. Use a graph to find the number of miles each person jogged.

4-2 Additional Practice

Solving Systems of Equations by Substitution

Use substitution to solve each system of equations.

1. $\begin{cases} y = -x + 4 \\ y = 3x \end{cases}$

2. $\begin{cases} y = 2x - 10 \\ 2y = x - 8 \end{cases}$

3. $\begin{cases} x - 2y = 12 \\ y = 3x + 14 \end{cases}$

4. $\begin{cases} x = 2y - 6 \\ y = 3x - 7 \end{cases}$
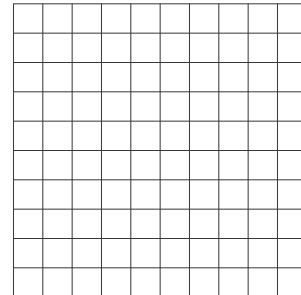
5. $\begin{cases} 6x - 4y = 18 \\ -x - 6y = 7 \end{cases}$

6. $\begin{cases} 9x - 3y = 9 \\ 3x - y = 3 \end{cases}$

7. $\begin{cases} y = 3x + 8 \\ 2y = 6x + 16 \end{cases}$

8. $\begin{cases} y = 4x + 5 \\ 12x - 3y = 9 \end{cases}$

9. $\begin{cases} 7y = -2x + 5 \\ 3x + 10y = 6 \end{cases}$

10. Solve the system $\begin{cases} x + y = 6 \\ 5x - y = 3 \end{cases}$
    by graphing and by substitution. Compare the methods. Which method is more accurate? Explain.

11. A community theater sold a total of 400 full-price tickets for adults and children. The price was $8.00 per adult ticket and $5.00 per children's ticket. If the total revenue was $2,750, how many adult tickets and how many children's tickets were sold?

4-3 Additional Practice

Solving Systems of Equations by Elimination

Use elimination to solve each system of equations.

1. $\begin{cases} x + y = 7 \\ x - y = -3 \end{cases}$

2. $\begin{cases} x - 2y = 10 \\ 3x + y = -12 \end{cases}$

3. $\begin{cases} 5x + 3y = 12 \\ x - 4y = 7 \end{cases}$

4. $\begin{cases} 6x + 2y = -12 \\ 4x + 3y = 7 \end{cases}$

5. $\begin{cases} 4x - 6y = 26 \\ 5x - 4y = 8 \end{cases}$

6. $\begin{cases} 5x + 3y = 13 \\ 7x + 8y = -16 \end{cases}$

Which solution method, graphing, substitution, or elimination, is the most appropriate for solving each system of equations? Explain.

7. $\begin{cases} 3x + 8y = -4 \\ 2x - 4y = 16 \end{cases}$

8. $\begin{cases} 6x - y = 16 \\ x = 4y - 5 \end{cases}$

9. $\begin{cases} x + y = 19 \\ 3x - 2y = -3 \end{cases}$

10. Determine whether the first system of equations is equivalent to the second system of equations. Explain.

$\begin{cases} 3x + 5y = 1 \\ 2x - 6y = 38 \end{cases}$ $\begin{cases} 18x + 30y = 6 \\ 10x - 30y = 190 \end{cases}$

11. The cost of 2 bottles of water and 4 apples is $5.50. The cost of 3 bottles of water and 5 apples is $7.50. Find the cost of one apple and the cost of one bottle of water.
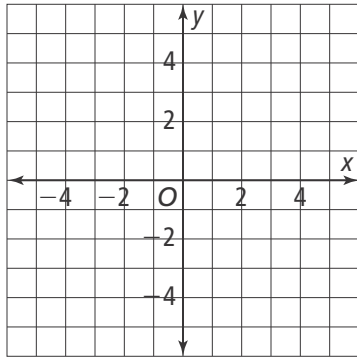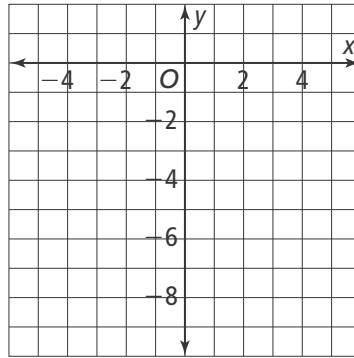
4-4 Additional Practice

Linear Inequalities in Two Variables
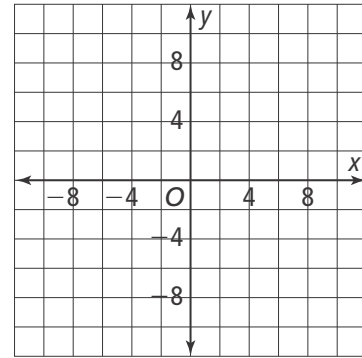
Graph the inequality in the coordinate plane.

1. $y < x$

2. $y \leq 3x - 6$
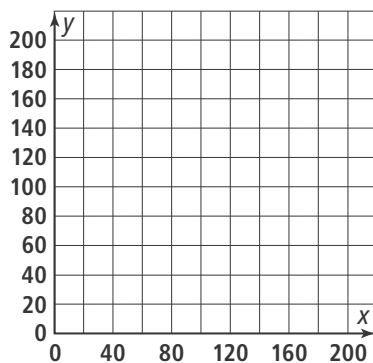
3. $x - 2y > -4$

4. Explain the process of graphing a linear inequality in two variables. Discuss how to determine whether the boundary line is solid or dashed.

5. Tickets to a play cost $10 at the door and $8 in advance. The theatre club wants to raise at least $800 from the sale of the tickets from the play. Write and graph an inequality for the number of tickets the theatre club needs to sell. If the club sells 40 tickets in advance, how many does it need to sell at the door to reach its goal? Use x to represent the number of tickets sold at the door. Use y to represent the number of tickets sold in advance.
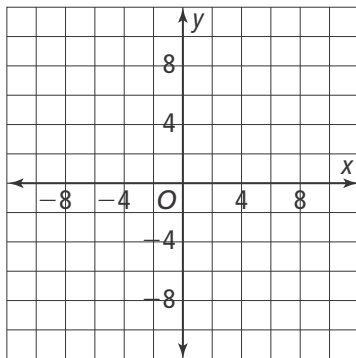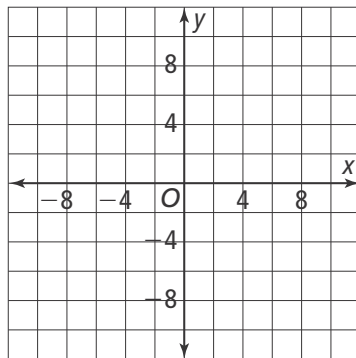
4-5 Additional Practice

Systems of Linear Inequalities

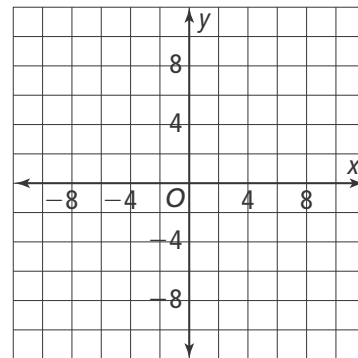**Graph each system of inequalities. Shade the solution of each system.**

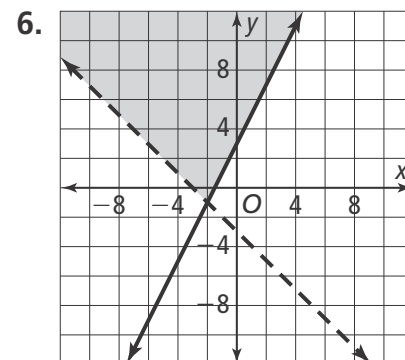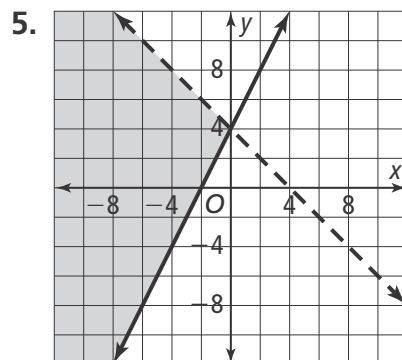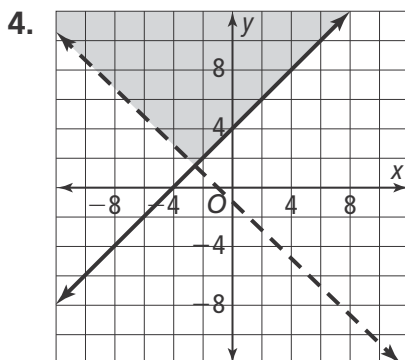1. $\begin{cases} y \leq 2x - 1 \\ y > -x + 3 \end{cases}$

2. $\begin{cases} 3x - 2y < 4 \\ -2x - 6y < -12 \end{cases}$

3. $\begin{cases} 2x + 2y \geq -6 \\ x + y \leq -1 \end{cases}$

The solution of what system of inequalities is shown by each graph?

4.

5.

6.

7. How do the solutions of a system of linear equations appear on a graph? Explain.

8. Larissa plans to bake at most 10 loaves of bread. She makes *x* loaves of banana bread that sell for $1.25 each and *y* loaves of nut bread that sell for $1.50 each. She hopes to make at least $24 in sales. Write and graph a system of inequalities for this situation. What does the graph show?

Nut Bread

Banana Bread