

NAME: _____

DATE: _____ E.H.R.: _____

Write Equations of Parallel and Perpendicular Lines Worksheet

Write an equation of the line that passes through the given point and is parallel to the given line. HINT: Rewrite them as $y=mx+b$

1) $(5, -1), y = -\frac{3}{5}x - 3$

2) $(1, 7), -6x + y = -1$

3) $(-2, 5), 2y = 4x - 6$

4) $(-10, 0), -y + 3x = 16$

5) Determine which lines, if any, are parallel or perpendicular. HINT: Rewrite them into $y=mx+b$

Line a: $y = \frac{3}{5}x + 1$

Line b: $5y = 3x - 2$

Line c: $10x - 6y = -4$

6) Determine which lines, if any, are parallel or perpendicular. HINT: Rewrite them into $y=mx+b$

Line a: $4x - 3y = 2$

Line b: $3x + 4y = -1$

Line c: $4y - 3x = 20$

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Directions: Write an equation of the line that passes through the given point and is perpendicular to the given line.

7) $(-9, 2)$, $y = 3x - 12$

8) $(7, 10)$, $y = .5x - 9$

9) $(-4, -1)$, $y = \frac{4}{3}x + 6$

CHALLENGE QUESTIONS:

10. Find the Equation of a line parallel to $y = -3$ passing through the coordinate $(2,6)$.

11. Find the Equation of a line perpendicular to $y = -3$ passing through the coordinate $(2,6)$.

12. Find the Equation of a line parallel to $x = 4$ passing through the coordinate $(-2,3)$.

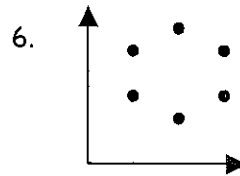
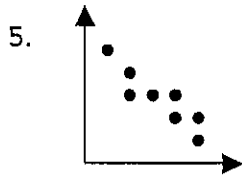
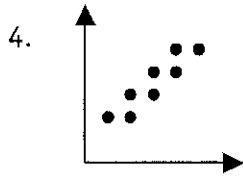
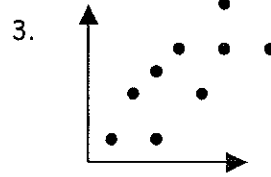
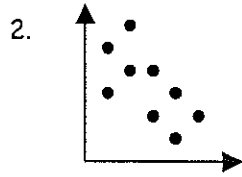
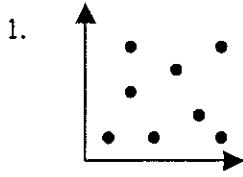
13. Find the Equation of a line perpendicular to $x = 4$ passing through the coordinate $(-2,3)$.

Name _____

Date _____ Class _____

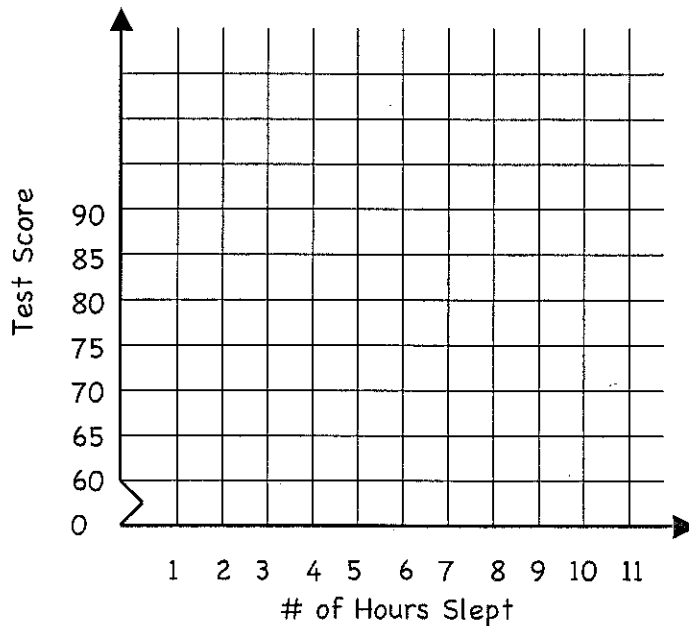
Practice with Scatter Plots

Classify the scatter plots as having a positive, negative, or no correlation.



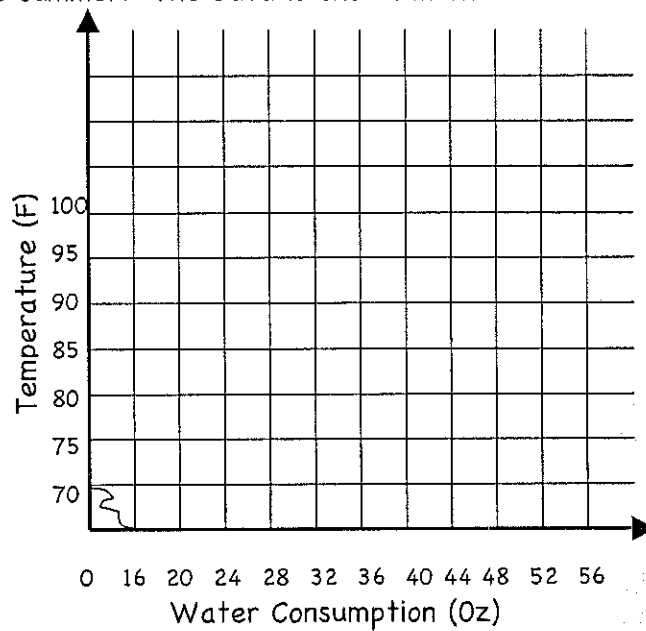
7. A history teacher asked her students how many hours of sleep they had the night before a test. The data below shows the number of hours the student slept and their score on the exam. Plot the data on a scatter plot.

Hours Slept	8	7	7	8	6	5	7	4	9	7
Test Score	83	86	74	88	76	63	90	60	89	81



8. Assume that during a three-hour period spent outside, a person recorded the temperature and their water consumption. The experiment was conducted on 7 randomly selected days during the summer. The data is shown in the table below.

Day	Temperature (F)	Water Consumption (oz)
1	99	48
2	85	27
3	97	48
4	75	16
5	92	32
6	85	25
7	83	20



Create a scatter plot with the data. What is the correlation of this scatter plot? (Hint: Do not use the day on the scatter plot.)

Identify the data sets as having a positive, a negative, or no correlation.

8. The number of hours a person has driven and the number of miles driven
9. The number of siblings a student has and the grade they have in math class
10. The age of a car and the value of the car
11. The number of weeks a CD has been out and the total sales
12. The number of years a person went to school and their income
13. The number of songs downloaded on your i-pod and the amount of memory available
14. The amount of time spent on the computer instant messaging your friends and the number of computers in your house
15. The age of a house and the number of people living in the house

2-5 Skills Practice

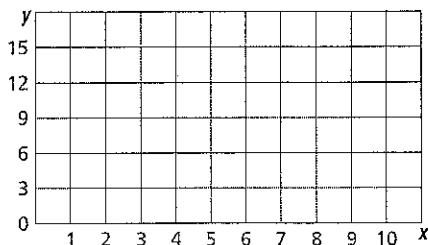
Scatter Plots and Lines of Regression

For Exercises 1-3, complete parts a-c.

- Make a scatter plot and a line of fit, and describe the correlation.
- Use two ordered pairs to write a prediction equation.
- Use your prediction equation to predict the missing value.

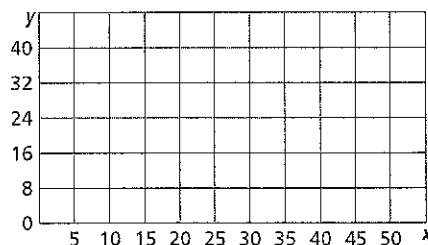
1.

x	y
1	1
3	5
4	7
6	11
7	12
8	15
10	?



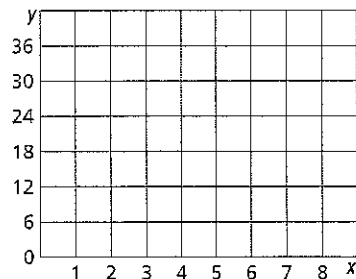
2.

x	y
5	9
10	17
20	22
25	30
35	38
40	44
50	?



3.

x	y
1	16
2	16
3	?
4	22
5	30
7	34
8	36



2-5 Practice

Scatter Plots and Lines of Regression

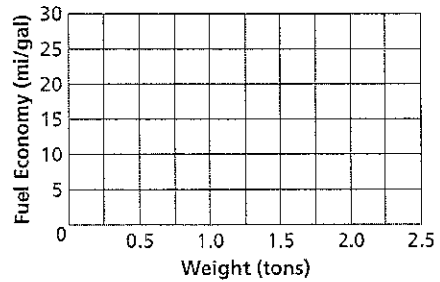
For Exercises 1 and 2, complete parts a–c.

- Make a scatter plot and a line of fit, and describe the correlation.
- Use two ordered pairs to write a prediction equation.
- Use your prediction equation to predict the missing value.

1. FUEL ECONOMY The table gives the weights in tons and estimates the fuel economy in miles per gallon for several cars.

Weight (tons)	1.3	1.4	1.5	1.8	2	2.1	2.4
Miles per Gallon	29	24	23	21	?	17	15

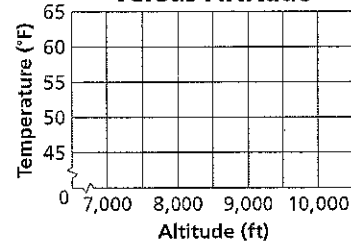
Fuel Economy Versus Weight



2. ALTITUDE As Anchara drives into the mountains, her car thermometer registers the temperatures ($^{\circ}\text{F}$) shown in the table at the given altitudes (feet).

Altitude (ft)	7500	8200	8600	9200	9700	10,400	12,000
Temperature ($^{\circ}\text{F}$)	61	58	56	53	50	46	?

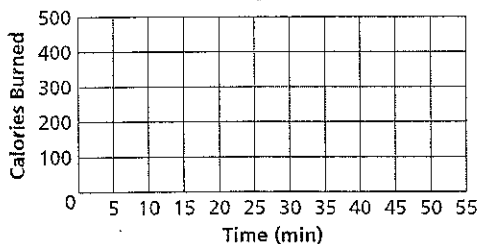
Temperature Versus Altitude



3. HEALTH Alton has a treadmill that uses the time on the treadmill to estimate the number of Calories he burns during a workout. The table gives workout times and Calories burned for several workouts. Find an equation for and graph a line of regression. Then use the function to predict the number of Calories burned in a 60-minute workout.

Time (min)	18	24	30	40	42	48	52	60
Calories Burned	260	280	320	380	400	440	475	?

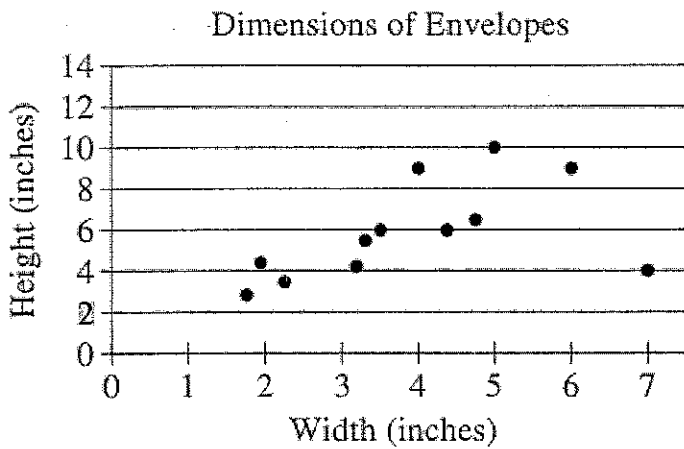
Burning Calories



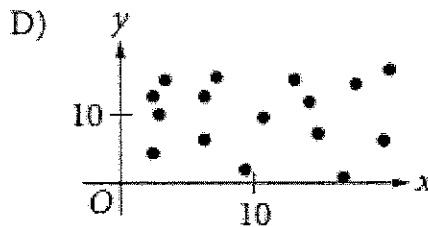
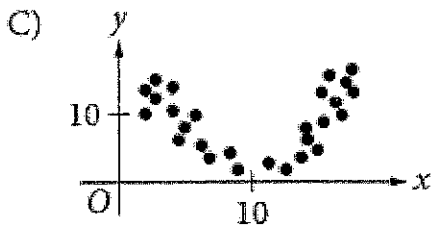
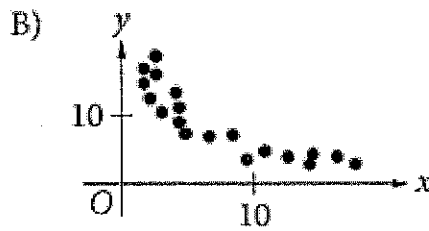
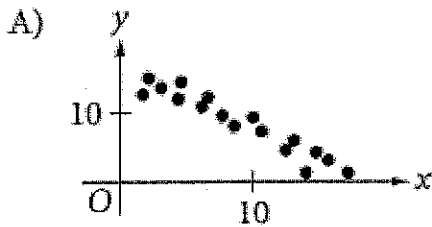
Name: _____ Date: _____ Hour: _____

Scatterplots & Lines of Best Fit - PSAT Practice

1) The scatterplot above shows the widths and the heights of 12 types of rectangular envelopes. What is the width, in inches, of the envelope represented by the data point that the outlier? (the outlier is a point that is far away from all of the rest of the data)



2) Which scatterplot shows a negative association that is not linear?



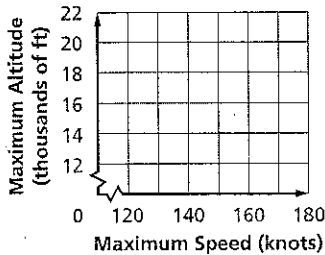
2-5 Word Problem Practice

Scatter Plots and Lines of Regression

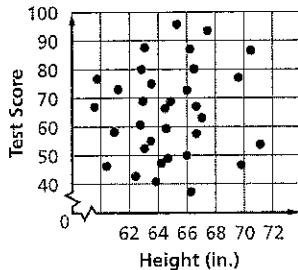
- 1. AIRCRAFT** The table shows the maximum speed and altitude of different aircraft. Draw a scatter plot of this data.

Max. Speed (knots)	121	123	137	173	153
Max. Altitude (1000 feet)	14.2	17.0	15.3	20.7	16.0

Source: RisingUp Aviation

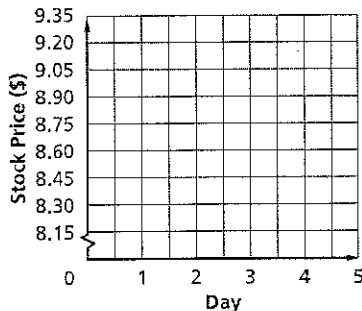


- 2. TESTING** The scatter plot shows the height and test scores of students in a math class. Describe the correlation between heights and test scores.

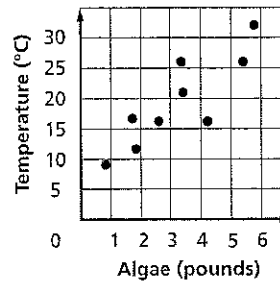


- 3. STOCKS** The prices of a technology stock over 5 days are shown in the table. Draw a scatter plot of the data and a line of fit.

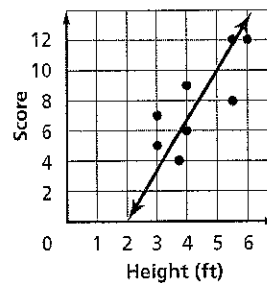
Day	1	2	3	4	5
Price	8.30	8.60	8.55	8.90	9.30



- 4. ALGAE** One type of algae grows fastest at 31°C. The scatter plot shows data recording the amount of algae and the temperature of the water in various aquarium tanks. Draw a line of fit for this data and write a prediction equation. Will this prediction equation be accurate for temperatures above 31°C?



- 5. SPORTS** The scatter plot shows the height and score of different contestants shooting darts.



- What is the equation of the line of fit?
- What do you predict someone 5 feet tall would score?

Name: _____ Date: _____ Hour: _____

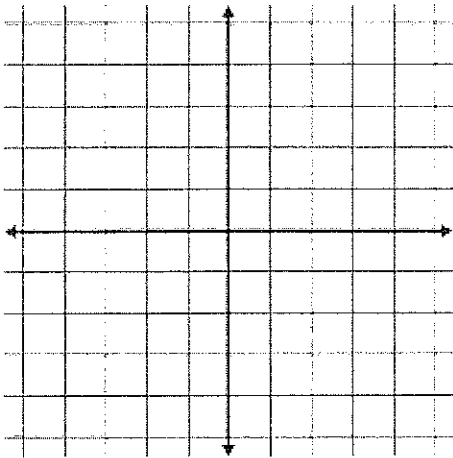
Guided Notes: Piecewise Defined Functions

Piecewise-defined function: _____

Example: Graph $f(x) = \begin{cases} x - 2 & \text{if } x < 1 \\ x + 3 & \text{if } x \geq -1 \end{cases}$

Identify the domain and range.

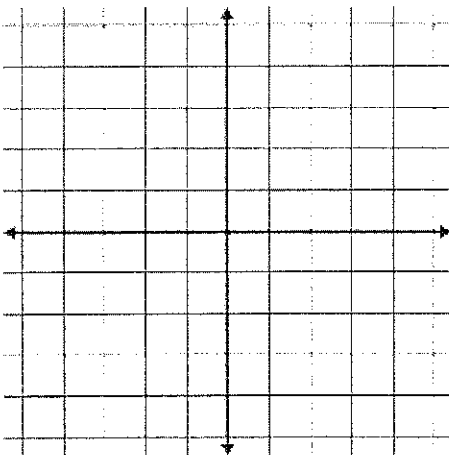
Step 1:



Step 2:

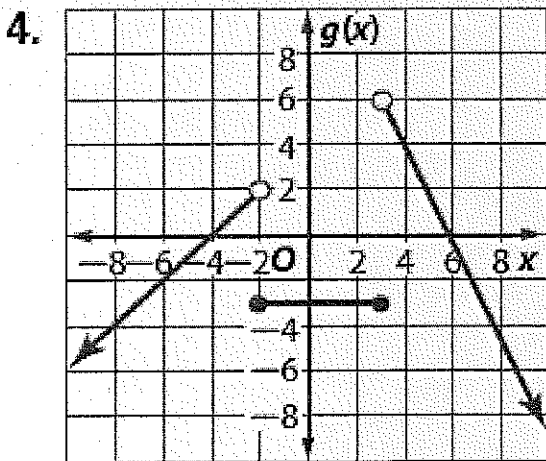
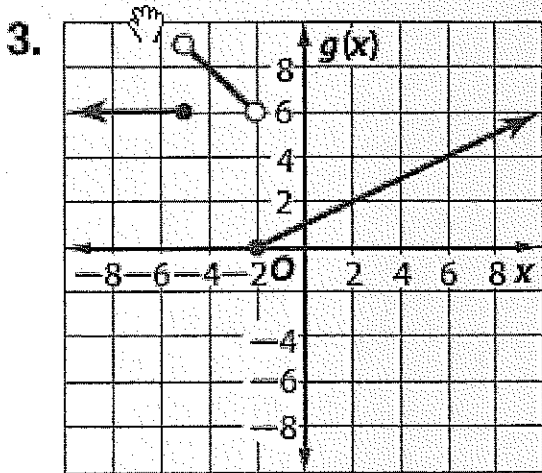
Example: Graph $f(x) = \begin{cases} x + 2 & \text{if } x < 0 \\ x & \text{if } x \geq 0 \end{cases}$

Domain and Range?:



How to write piecewise-defined functions

Write the piecewise-defined functions shown in the graphs below.



Name _____

Period _____

Worksheet - Piecewise Functions

Evaluate the following for $f(x) = \begin{cases} 3x-5, & x > 4 \\ x^2, & x \leq 4 \end{cases}$:

1. $f(7)$

2. $f(4)$

3. $f(-3)$

Evaluate the following for $f(x) = \begin{cases} -2|x+1|, & x \leq 1 \\ 3, & 1 < x < 3 \\ 6-2x, & x \geq 3 \end{cases}$:

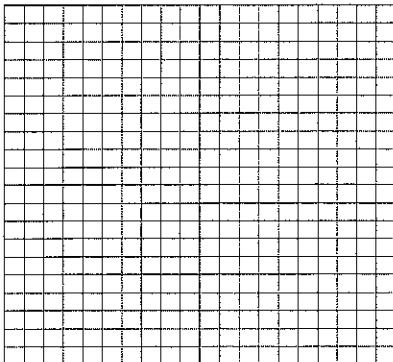
4. $f(10)$

5. $f(2)$

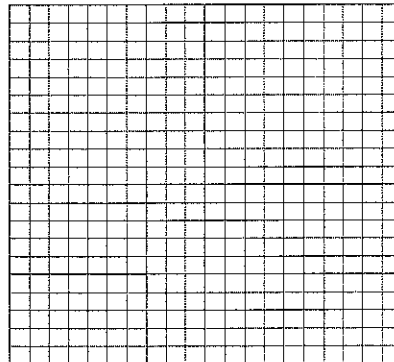
6. $f(0)$

Graph the following piecewise functions.

7. $f(x) = \begin{cases} -2, & x < 0 \\ 3, & x \geq 0 \end{cases}$



8. $g(x) = \begin{cases} -x+2, & x < 2 \\ x-2, & x \geq 2 \end{cases}$



Part II. Evaluate the piecewise function for the given values of x .

$$1. \quad f(x) = \begin{cases} x+5 & \text{if } x < -2 \\ -4 & \text{if } x \geq -2 \end{cases}$$

$$f(3) =$$

$$f(-4) =$$

$$f(-2) =$$

$$2. \quad f(x) = \begin{cases} 2x+1 & \text{if } x < 1 \\ -2x+3 & \text{if } x \geq 1 \end{cases}$$

$$f(-2) =$$

$$f(6) =$$

$$f(1) =$$

$$3. \quad f(x) = \begin{cases} -2x-4 & \text{if } x \leq 2 \\ 4x-9 & \text{if } x > 2 \end{cases}$$

$$f(-4) =$$

$$f(8) =$$

$$f(2) =$$

$$4. \quad f(x) = \begin{cases} x-1 & \text{if } x \leq -2 \\ 2x-1 & \text{if } -2 < x \leq 4 \\ -3x+8 & \text{if } x > 4 \end{cases}$$

$$f(-1) =$$

$$f(-4) =$$

$$f(5) =$$

$$5. \quad f(x) = \begin{cases} x & \text{if } x \leq -1 \\ -x+4 & \text{if } x > -1 \end{cases}$$

$$f(-4) =$$

$$f(0) =$$

$$f(3) =$$

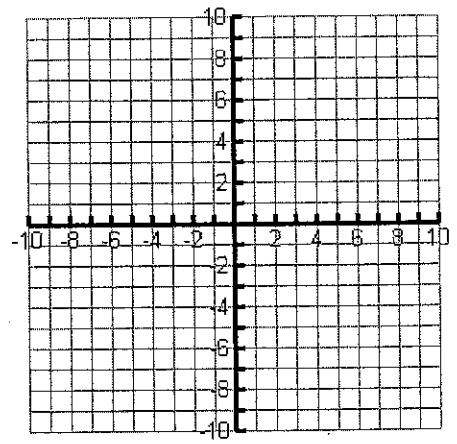
$$6. \quad f(x) = \begin{cases} 5 & \text{if } x < -2 \\ \frac{1}{2}x-6 & \text{if } -2 \leq x \leq 6 \\ -2x+10 & \text{if } x > 6 \end{cases}$$

$$f(-4) =$$

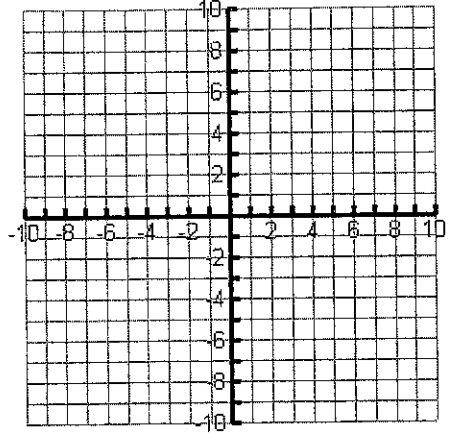
$$f(8) =$$

$$f(-2) =$$

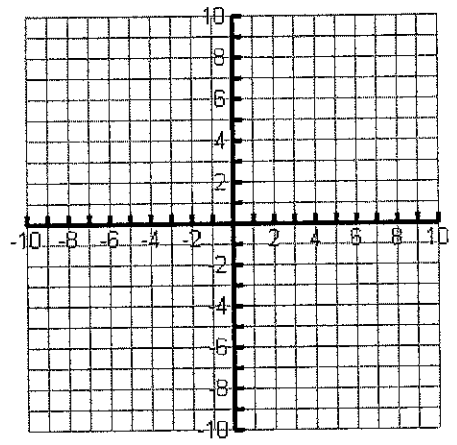
1. $f(x) = \begin{cases} -x & \text{if } x \leq 2 \\ x & \text{if } x > 2 \end{cases}$



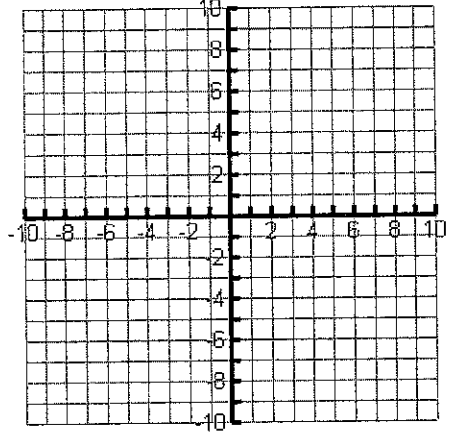
2. $f(x) = \begin{cases} 2, & x > -3 \\ -5, & x < -3 \end{cases}$



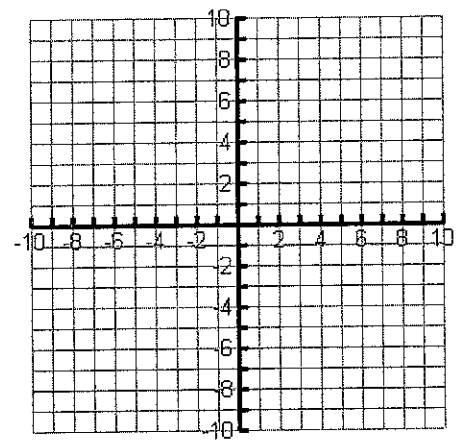
3. $f(x) = \begin{cases} -1, & x \leq -2 \\ 2, & x > -2 \end{cases}$



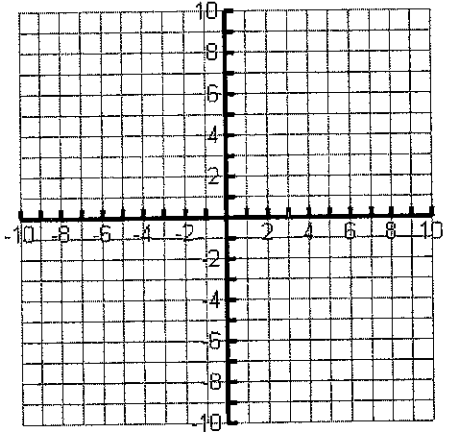
4. $f(x) = \begin{cases} -1, & x \leq -1 \\ 1, & -1 < x < 1 \\ x, & x > 1 \end{cases}$



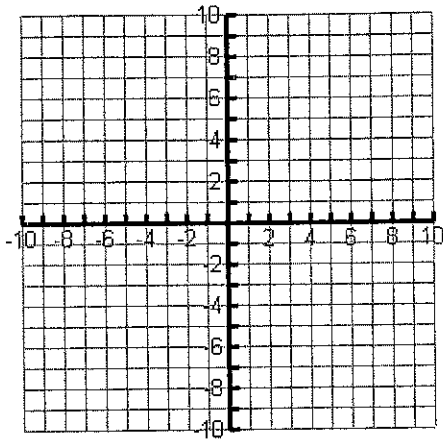
5. $f(x) = \begin{cases} -x + 2, & x \leq 0 \\ \frac{1}{2}x + 3, & x > 0 \end{cases}$



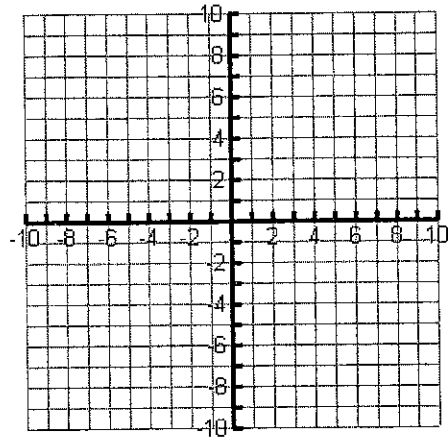
6. $f(x) = \begin{cases} x + 2, & x \leq 2 \\ -\frac{1}{2}x + 4, & x > 2 \end{cases}$



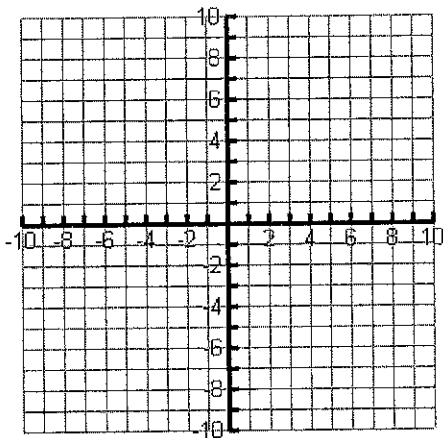
$$7. f(x) = \begin{cases} -3x - 4, & x \leq -2 \\ x + 1, & x > -2 \end{cases}$$



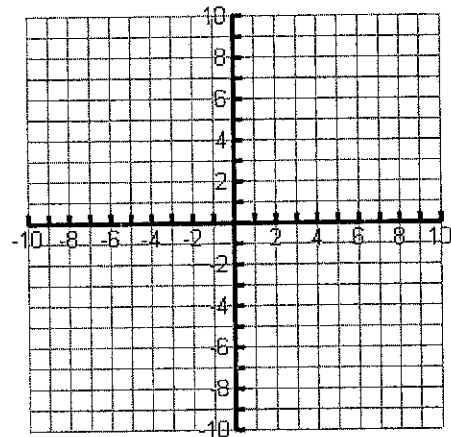
$$8. f(x) = \begin{cases} -x, & x \leq 0 \\ 2x - 2, & x > 0 \end{cases}$$



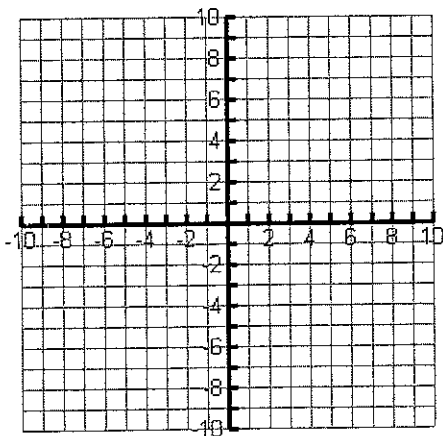
$$9. f(x) = \begin{cases} -x - 4, & x < -2 \\ -\frac{1}{2}x, & -2 \leq x \leq 2 \\ -1, & x > 2 \end{cases}$$



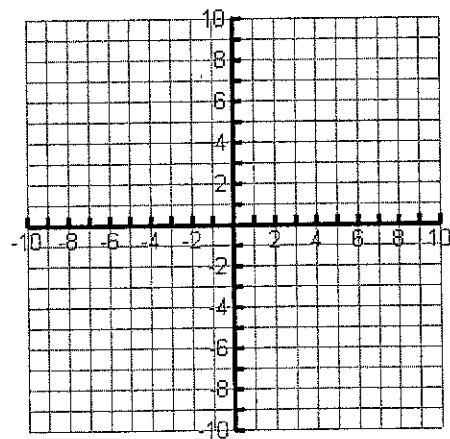
$$10. f(x) = \begin{cases} 3, & x < -1 \\ x + 1, & 1 \leq x \leq 4 \end{cases}$$



$$11. f(x) = \begin{cases} \frac{1}{2}x - 1, & x \neq 4 \\ 3, & x = 4 \end{cases}$$



$$12. f(x) = \begin{cases} x + 4, & -6 \leq x < 2 \\ -6, & x = 2 \\ -x + 2, & x > 2 \end{cases}$$



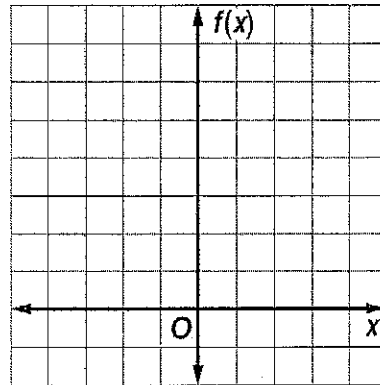
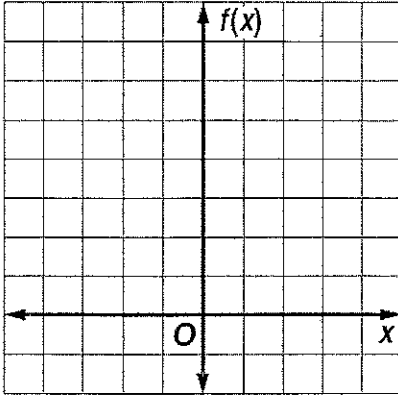
2-6 Special Functions Day 1

Learning Target: I can write and graph piecewise-defined functions.

Graph each function. Identify the domain and range.

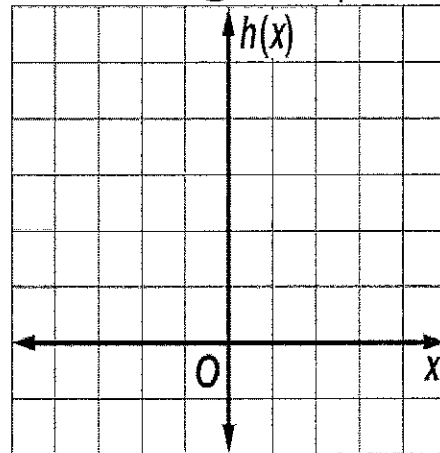
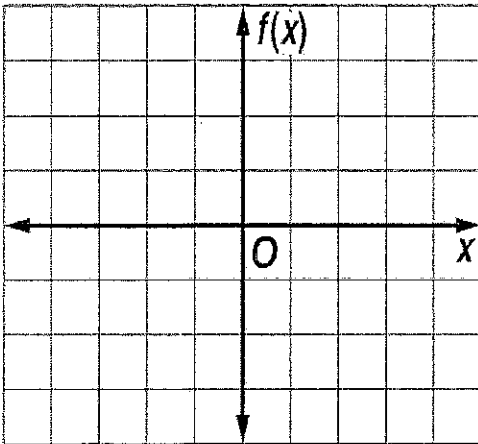
$$1. f(x) = \begin{cases} -1 & \text{if } x \leq 0 \\ 2x & \text{if } 0 < x \leq 3 \\ 6 & \text{if } x > 3 \end{cases}$$

$$2. f(x) = \begin{cases} -x & \text{if } x < -1 \\ 0 & \text{if } -1 < x \leq 1 \\ x & \text{if } x > 1 \end{cases}$$



$$3. f(x) = \begin{cases} x & \text{if } x < 0 \\ 2 & \text{if } x \geq 0 \end{cases}$$

$$4. h(x) = \begin{cases} 3 & \text{if } x < -1 \\ x+1 & \text{if } x > 1 \end{cases}$$

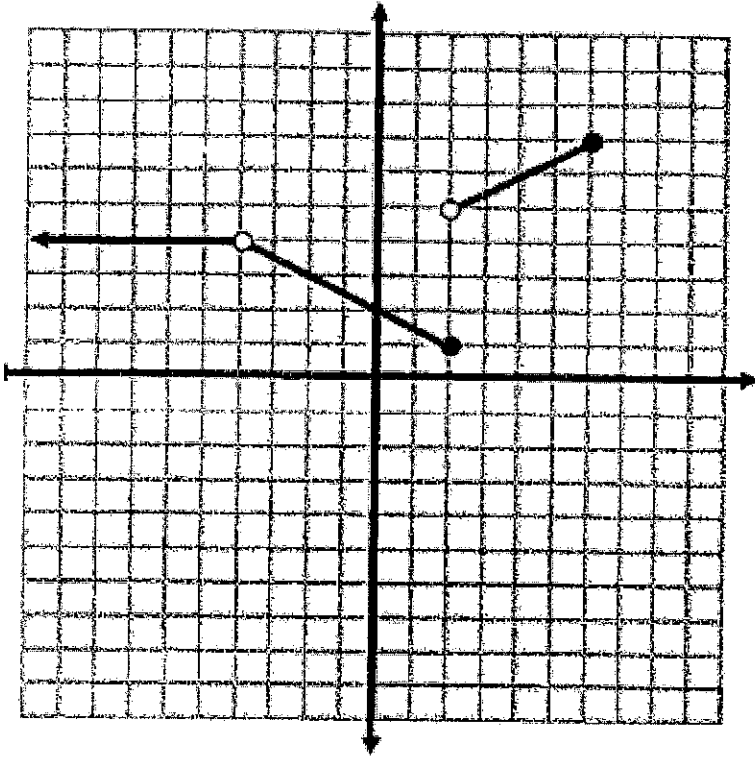


NAME

DATE

PERIOD

1) Write a piecewise function for the accompanying graph.



2) Write a piecewise function for the accompanying graph.

