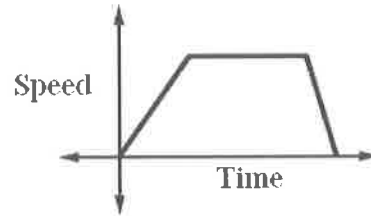


# Interpreting Graphs

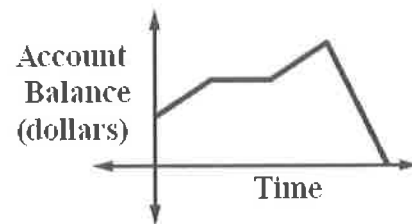
TU-1: I can interpret graphs that model real world scenarios.

*Identify the independent and dependent variables for each relation. Then describe what is happening in each graph. Describe what the x and y intercepts mean in context to the problem.*

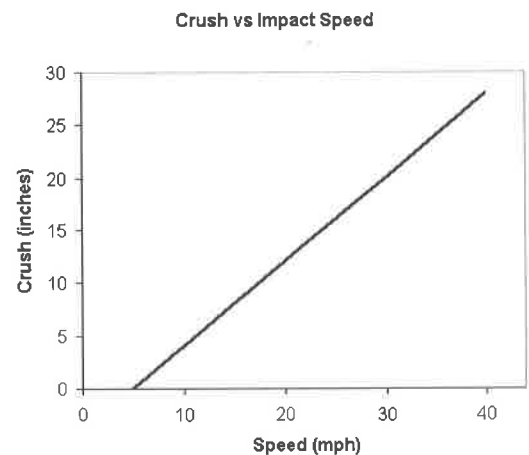
1. The graph represents the speed of a car as it travels to the grocery store.



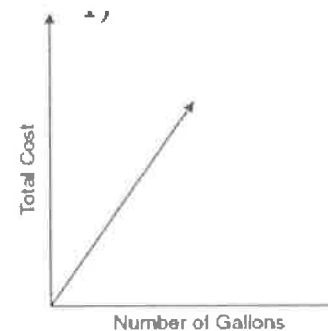
2. The graph represents the balance of a savings account over time.



3. The graph represents crush in inches related to the speed the car was traveling.



4. The graph represents the number gallons you buy and the total cost of the gas.

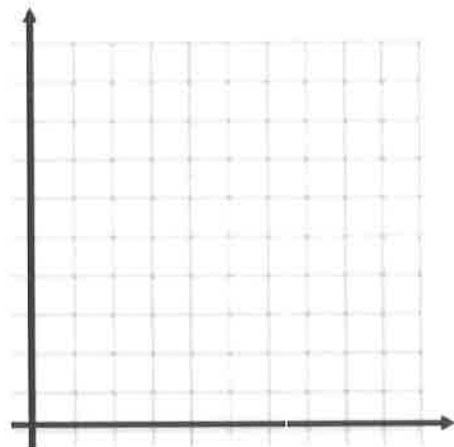


*Sketch a graph for the following situations. Identify the independent and dependent variables. Then explain what the  $x$  and  $y$  intercepts mean in context to the problem.*

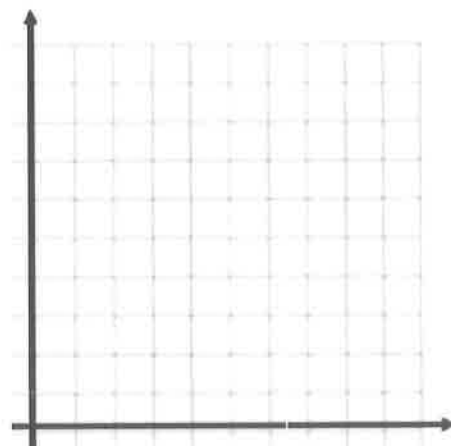
- a. The height of a child at birth and on each birthday from age 1 to age 25
  
  
  
  
  
  
  
  
  
  
- b. The height of a ball that is thrown upward from the top of a building from the time it is thrown until it hits the ground

*For the following problems draw a graph to go with the story. Label the  $x$  and  $y$  axis.*

- a. The monthly electric bill for August of one year to July of the next year for a family living in Newberg, Oregon, in a home with central air conditioning. (Assume that July and August are the hottest months and that the family uses natural gas for heating.)



- b. My dad drove me to school this morning. We started off by driving for 10 minutes at about 30 miles per hour. We stopped at a stoplight for 2 minutes, and then drove on at 20 mph for about 5 minutes. We got on the expressway and drove at 50 mph for about 30 minutes. We got off the expressway and stopped at a stop sign for a minute. Then we drove into the schoolyard and stopped.



# Function Notation

TU-2: I can identify functions and use function notation

1. Evaluate the following expressions given the functions below:

$$g(x) = -3x + 1$$

$$f(x) = x^2 + 7$$

$$h(x) = \frac{12}{x}$$

$$j(x) = 2x + 9$$

a.  $g(10) =$

b.  $f(3) =$

c.  $h(-2) =$

d.  $j(7) =$

e.  $h(a) =$

f. Find  $x$  if  $g(x) = 16$

g. Find  $x$  if  $h(x) = -2$

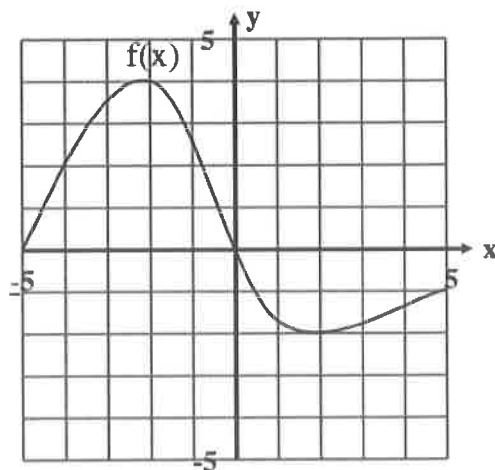
h. Find  $x$  if  $f(x) = 23$

i.  $j(2x) =$

j.  $g(b + c) =$

k.  $f(h(x)) =$

2. Given this graph of the function  $f(x)$ :



Find:

a.  $f(-4) =$

b.  $f(0) =$

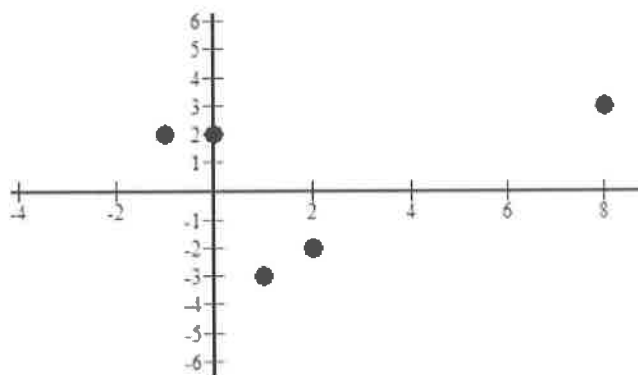
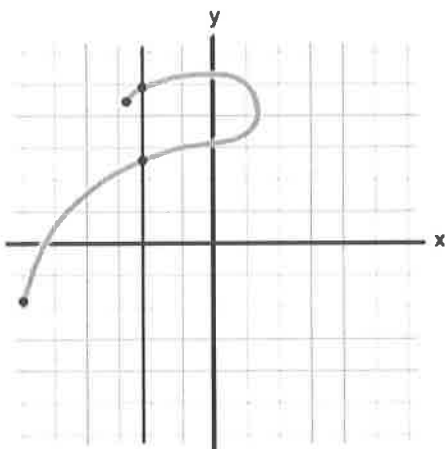
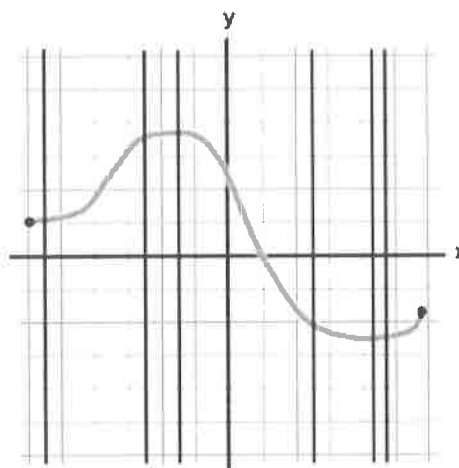
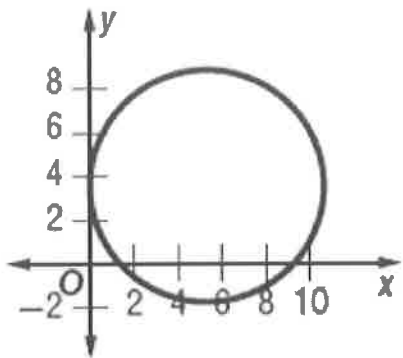
c.  $f(3) =$

d.  $f(-5) =$

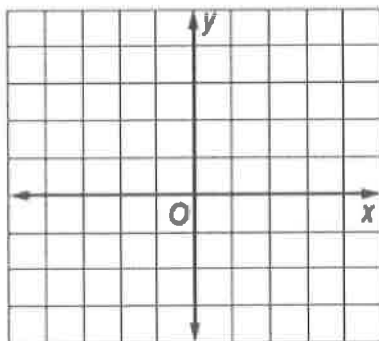
e. Find  $x$  when  $f(x) = 2$

f. Find  $x$  when  $f(x) = 0$

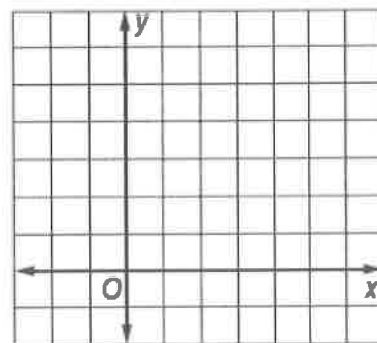
3. Determine whether the following are functions or not using the vertical line test.



5.  $\{(2, -3), (2, 4), (2, -1)\}$



6.  $\{(2, 6), (6, 2)\}$



# Describing Transformations

TU-3: I can transform equations and explain the motion.

For the following problems:

- Describe the transformation that is happening.
- Determine the domain and range.

**\*\*All of this should be done without graphing\*\***

1.  $y = (x - 5)^2$

Domain: \_\_\_\_\_ Range: \_\_\_\_\_

2.  $y = |x| - 3$

Domain: \_\_\_\_\_ Range: \_\_\_\_\_

3.  $y = 4 + \sqrt{x - 7}$

Domain: \_\_\_\_\_ Range: \_\_\_\_\_

4.  $y - 5 = (x + 1)^2$

Domain: \_\_\_\_\_ Range: \_\_\_\_\_

5.  $y = -3(x + 4)^2 + 6$

Domain: \_\_\_\_\_ Range: \_\_\_\_\_

6.  $\frac{y}{2} = \left| \frac{x}{4} \right| + 2$

Domain: \_\_\_\_\_ Range: \_\_\_\_\_

7.  $\frac{y+1}{-3} = \sqrt{x+2}$

Domain: \_\_\_\_\_ Range: \_\_\_\_\_

# Describing Transformations

TU-3: I can transform equations and explain the motion.

For the following problems:

- Describe the transformation that is happening.
- Write an equation for the transformations.
- Determine the domain and range.

**\*\*All of this should be done without graphing\*\***

1.  $y = \sqrt{x}$  shifted down 5 units and vertically stretched by 2.

Equation: \_\_\_\_\_ Domain: \_\_\_\_\_ Range: \_\_\_\_\_

2.  $y = x^2$  Shifted to the right 3 units, up 4 units and is reflected of the x-axis.

Equation: \_\_\_\_\_ Domain: \_\_\_\_\_ Range: \_\_\_\_\_

3.  $y = |x|$  Stretched horizontally by 3 and vertically by 7. Then shifted to the left 5 and up 12.

Equation: \_\_\_\_\_ Domain: \_\_\_\_\_ Range: \_\_\_\_\_

4.  $y = x^2$  Vertically stretched by  $\frac{2}{3}$ , shifted right 10, down 3 units and then reflected over the y-axis.

Equation: \_\_\_\_\_ Domain: \_\_\_\_\_ Range: \_\_\_\_\_

5.  $y = \sqrt{x}$  Reflected across the y-axis. Then horizontally stretched by 6 and shifted down 4 units.

Equation: \_\_\_\_\_ Domain: \_\_\_\_\_ Range: \_\_\_\_\_

6.  $y = |x|$  Shifted up 4 units and to the left 5 units. Then it is reflected over both axis and vertically stretched by 2.

Equation: \_\_\_\_\_ Domain: \_\_\_\_\_ Range: \_\_\_\_\_

7. A ball is dropped from a height of 500 meters and is given with the function  $h(t) = -4.9t^2 + 500$ . Another ball is dropped from a height of 175 meters and its functions is  $h(t) = -4.9t^2 + 175$ . What is the transformation happening between the two equations? How long will it take in both equations for the ball to reach 50 meters?

# Graphing Transformations

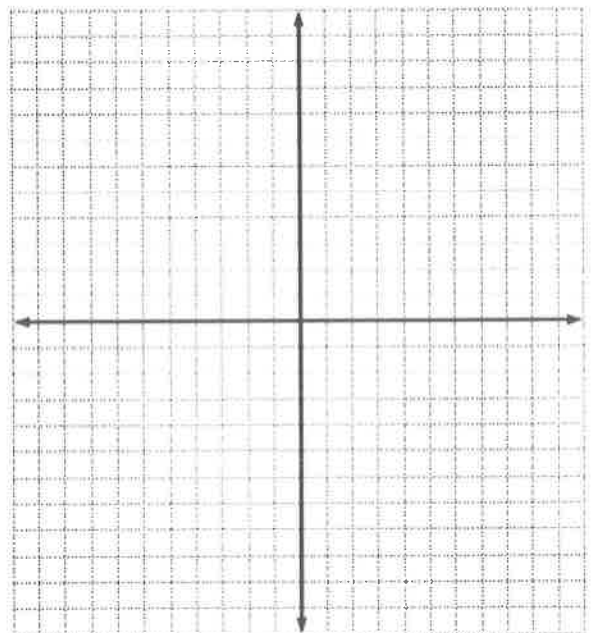
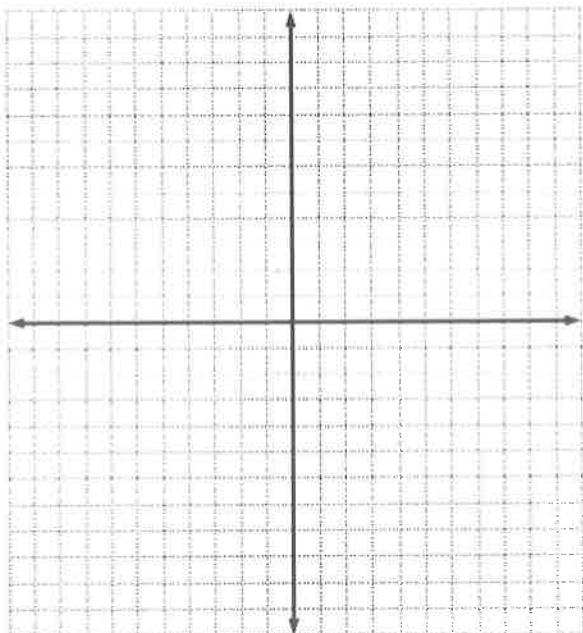
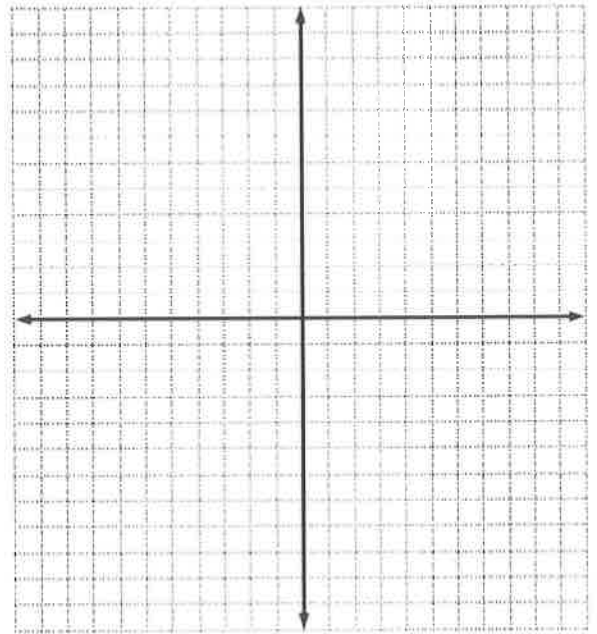
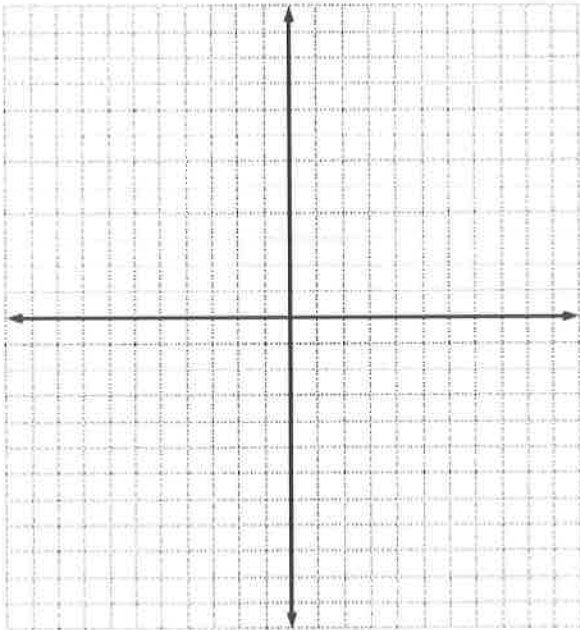
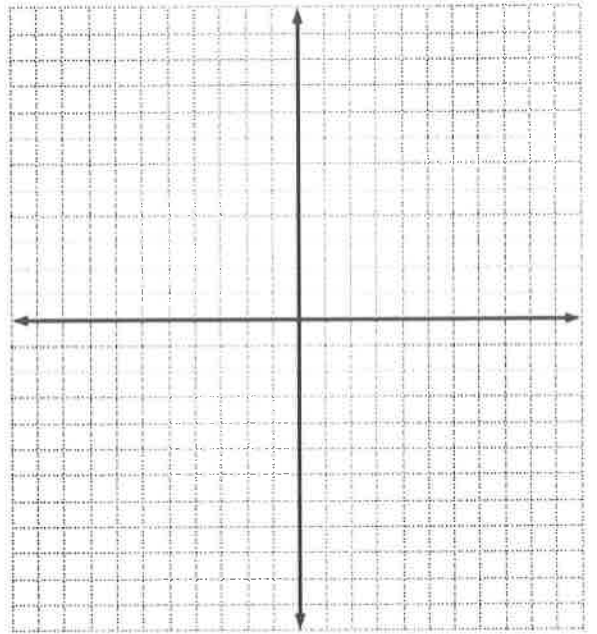
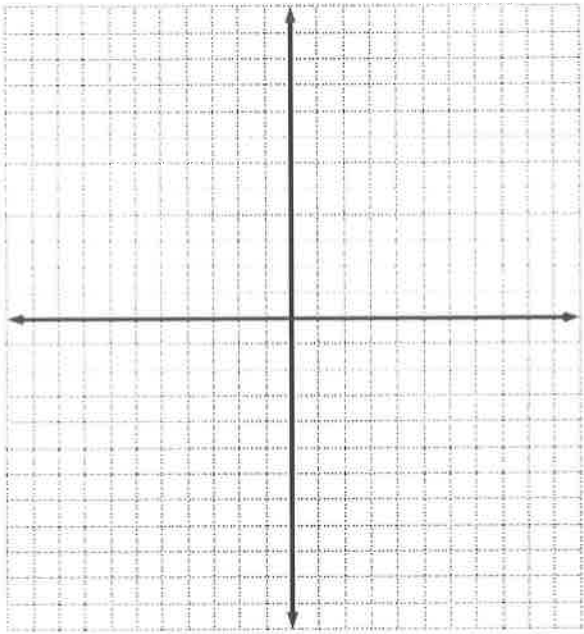
## TU-4 Retake Problems

Graph the groups of functions on the following graphs. Determine the domain and range for each function. Each family of graphs should be on a separate page of graphs.

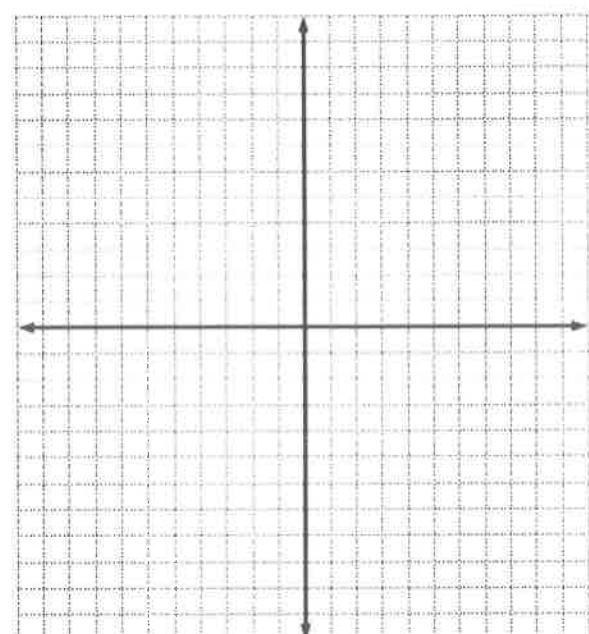
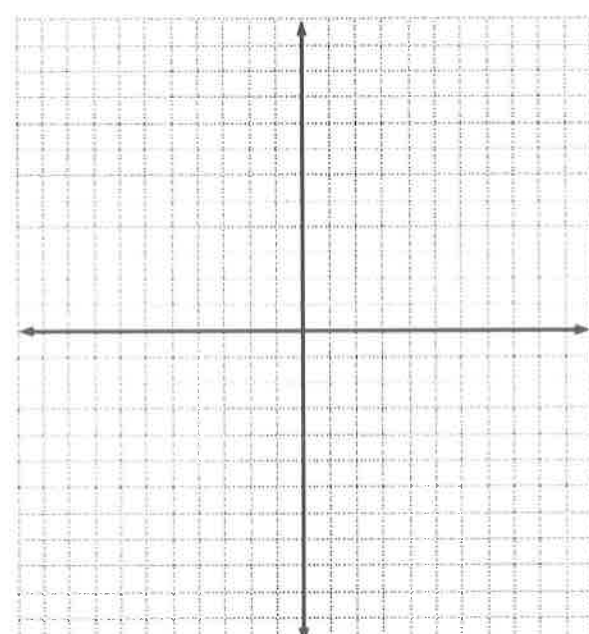
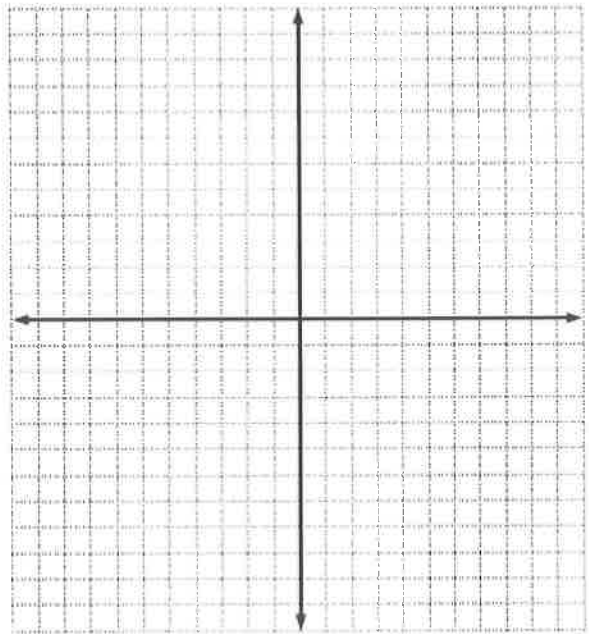
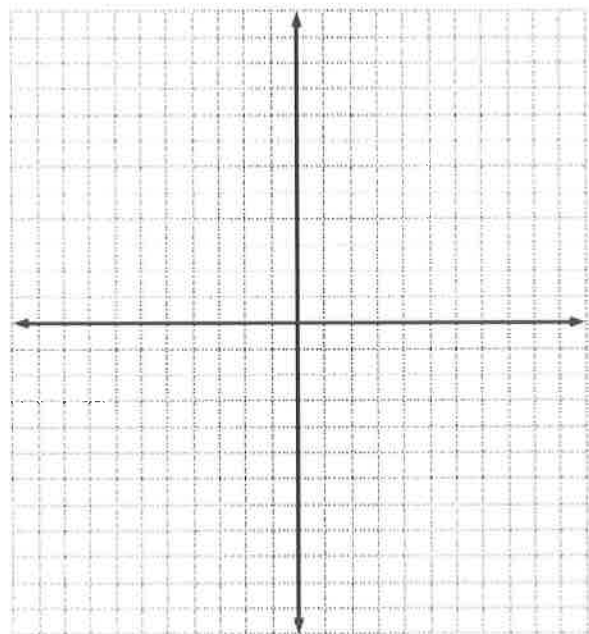
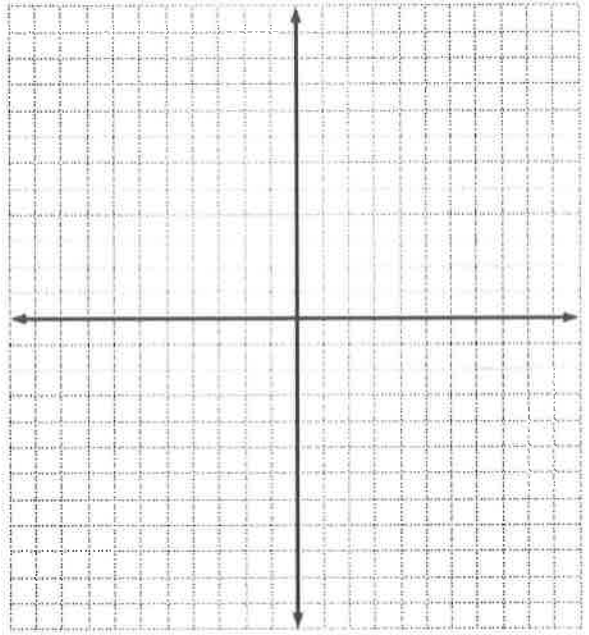
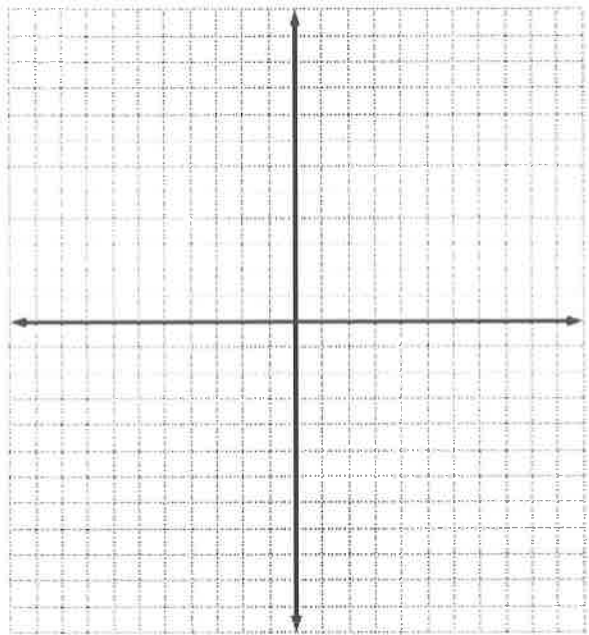
Quadratic Parent Function	$y = x^2$	Domain: All real numbers	Range: $y \geq 0$
1. $y = (x - 2)^2$		2. $y - 3 = (x + 1)^2$	
3. $y = 2x^2 - 4$		4. $\frac{y}{-3} = (x - 1)^2 - 6$	
5. $y = \frac{1}{2}(-x + 7)^2 + 3$		6. $-y = \left(-\frac{x+2}{2}\right)^2 + 5$	

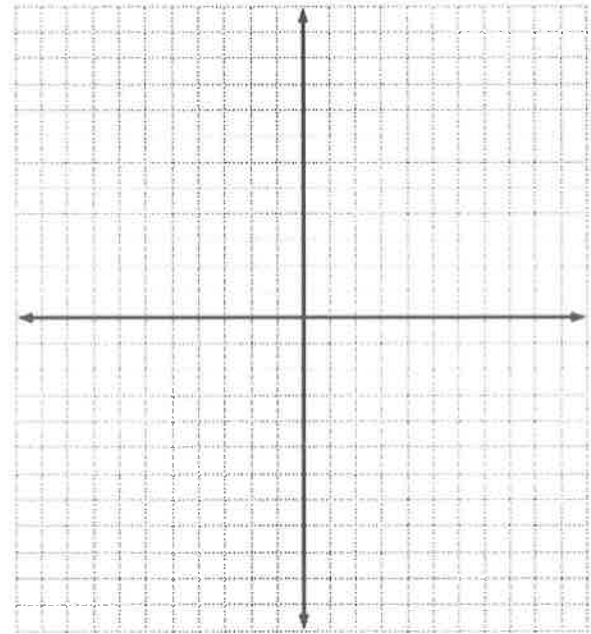
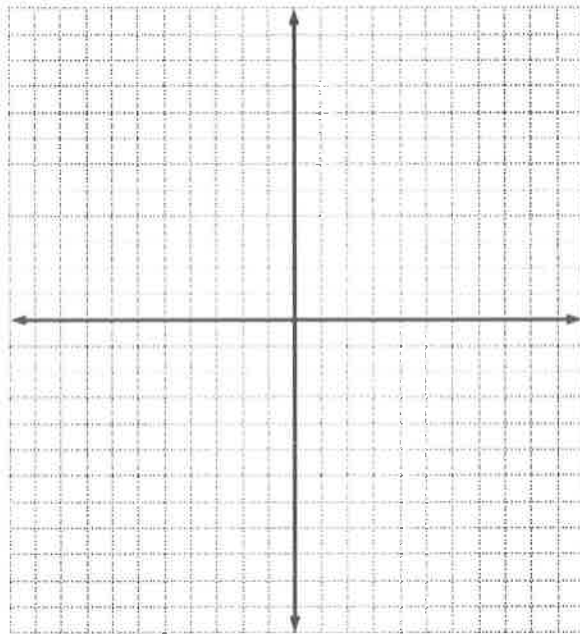
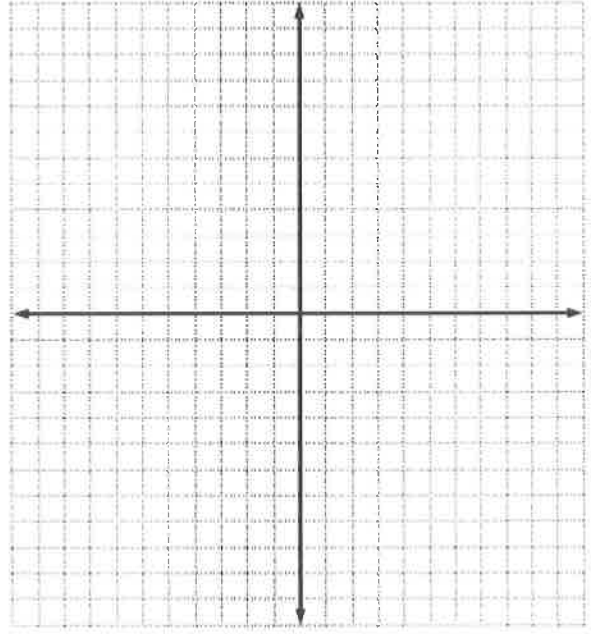
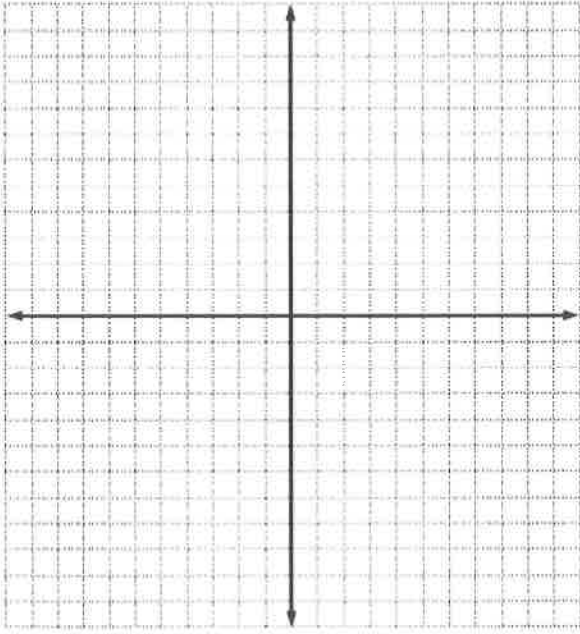
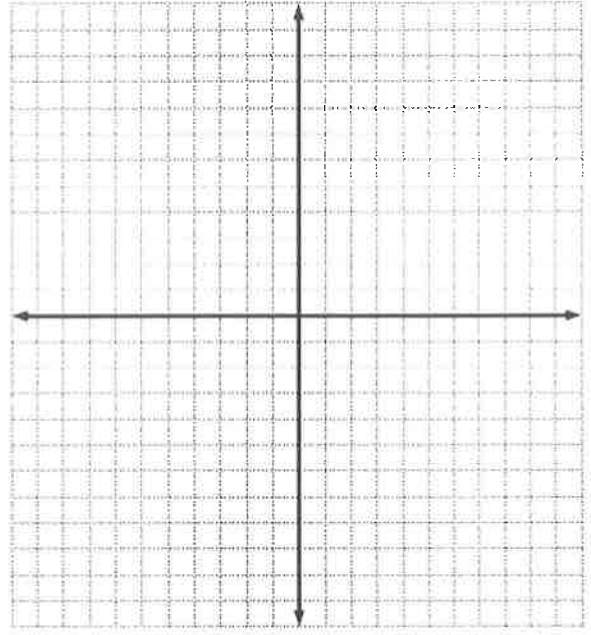
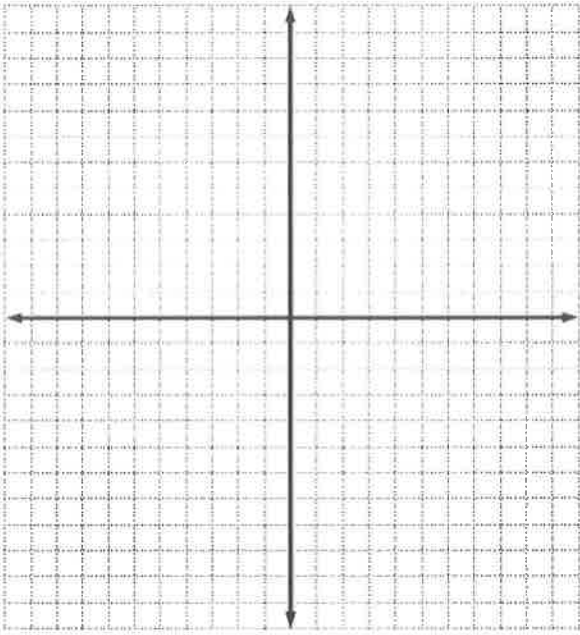
Square Root Parent Function	$y = \sqrt{x}$	Domain: $x \geq 0$	Range: $y \geq 0$
1. $y = \sqrt{x} + 3$		2. $y = \sqrt{\frac{x-1}{3}} + 1$	
3. $y = \sqrt{-x + 2}$		4. $-y = \frac{1}{2}\sqrt{-x + 3} - 2$	
5. $y = -2\sqrt{x + 5} + 2$		6. $y^2 = x - 2$	

Absolute Value Parent Function	$y =  x $	Domain: All Real Numbers	Range: $y \geq 0$
1. $y =  x + 4 $		2. $y + 4 =  x - 5 $	
3. $y = 2 x - 1  + 2$		4. $\frac{y}{3} = - x  + 1$	
5. $y = -4 x + 7  + 10$		6. $y - 1 = -\left \frac{x+2}{3}\right $	





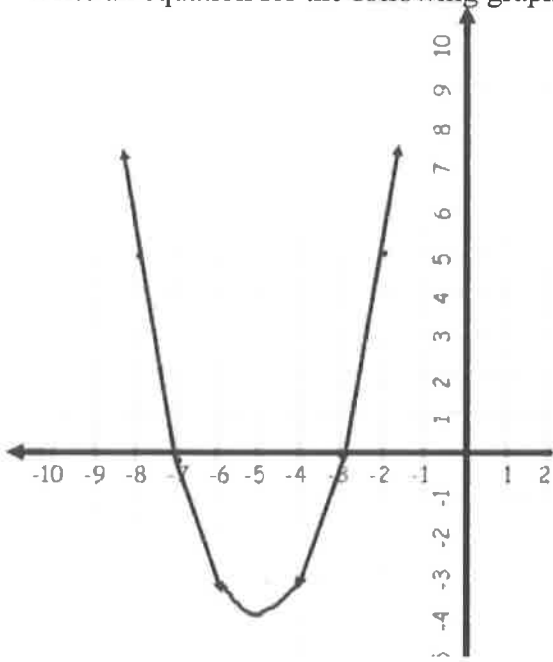




# Writing an Equation from a Graph

Tr T-5 I can write the equation of linear, quadratic, square root, and absolute value graphs.

Write an equation for the following graphs. Determine their parent function and the domain and range.

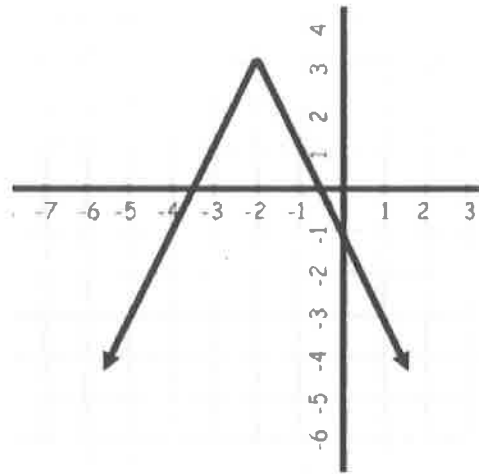


Parent function: \_\_\_\_\_

Equation: \_\_\_\_\_

Domain: \_\_\_\_\_

Range: \_\_\_\_\_

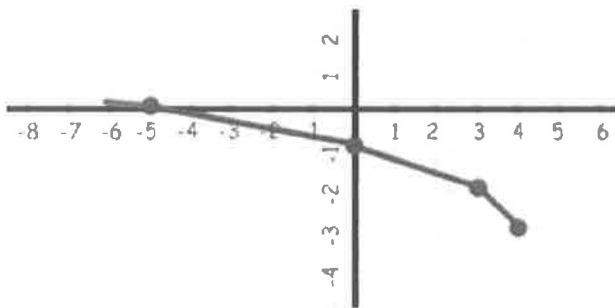


Parent function: \_\_\_\_\_

Equation: \_\_\_\_\_

Domain: \_\_\_\_\_

Range: \_\_\_\_\_

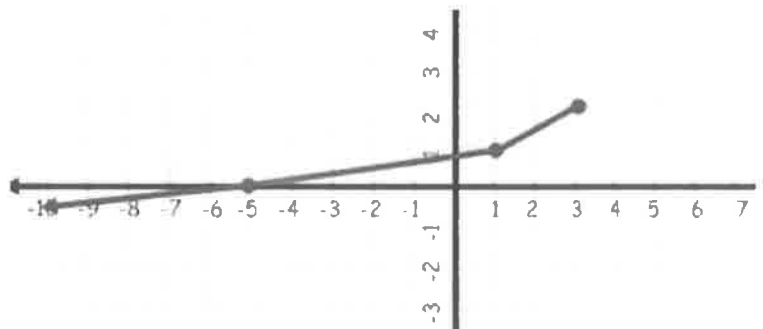


Parent function: \_\_\_\_\_

Equation: \_\_\_\_\_

Domain: \_\_\_\_\_

Range: \_\_\_\_\_



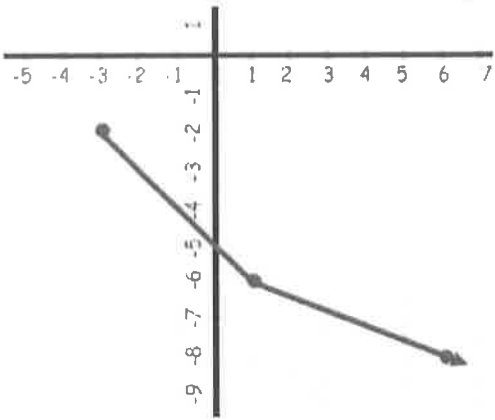
Parent function: \_\_\_\_\_

Equation: \_\_\_\_\_

Domain: \_\_\_\_\_

Range: \_\_\_\_\_

# Writing an Equation from a Graph

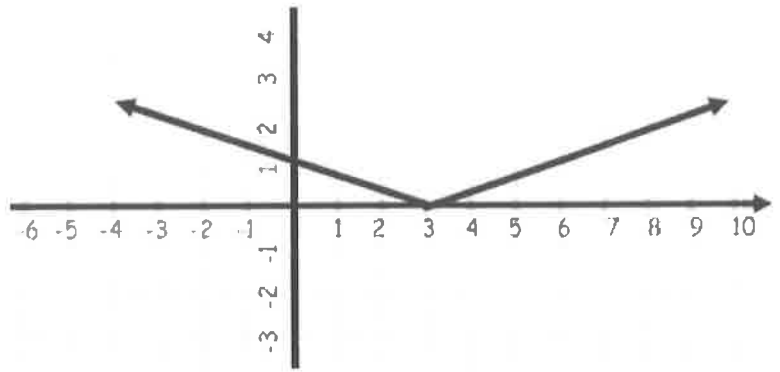


Parent function: \_\_\_\_\_

Equation: \_\_\_\_\_

Domain: \_\_\_\_\_

Range: \_\_\_\_\_

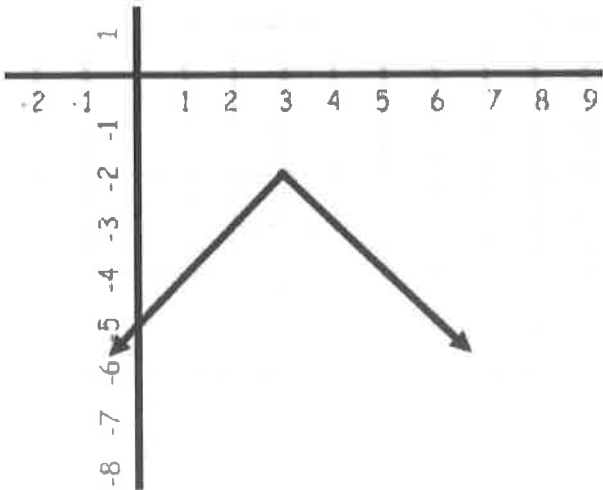


Parent function: \_\_\_\_\_

Equation: \_\_\_\_\_

Domain: \_\_\_\_\_

Range: \_\_\_\_\_

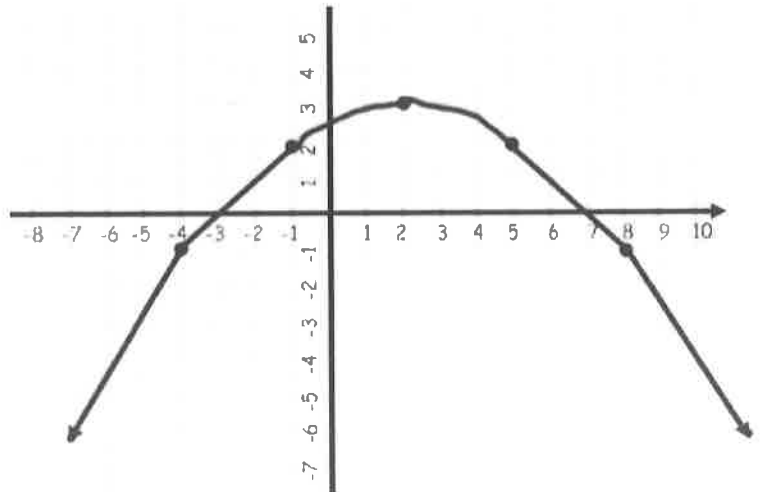


Parent function: \_\_\_\_\_

Equation: \_\_\_\_\_

Domain: \_\_\_\_\_

Range: \_\_\_\_\_



Parent function: \_\_\_\_\_

Equation: \_\_\_\_\_

Domain: \_\_\_\_\_

Range: \_\_\_\_\_