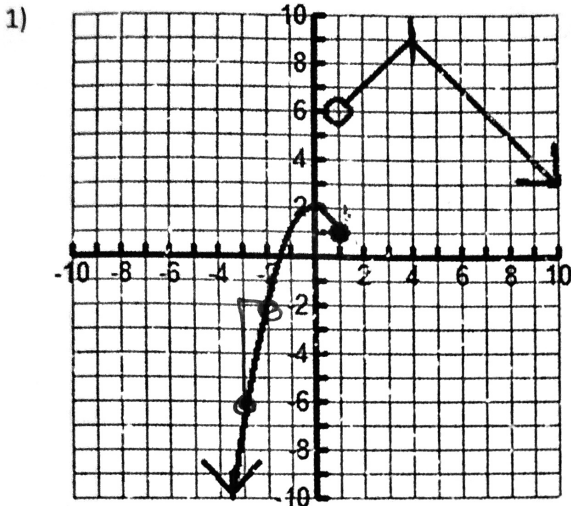
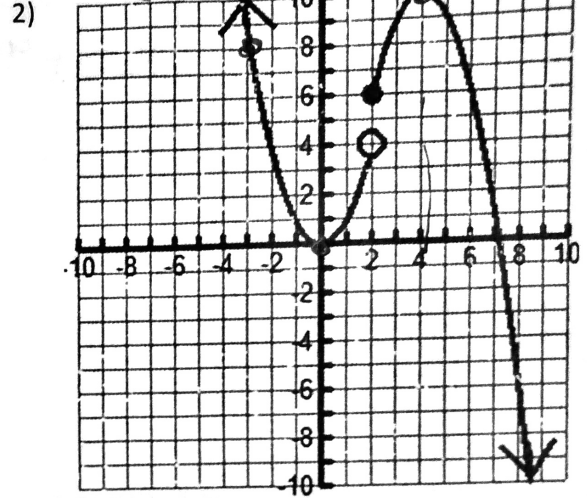


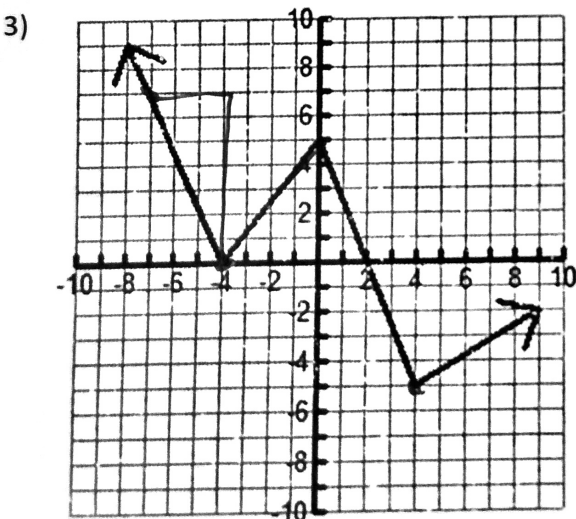
For #1-4, State the domain and range for the function, then determine for what values of the domain the function is increasing and decreasing.



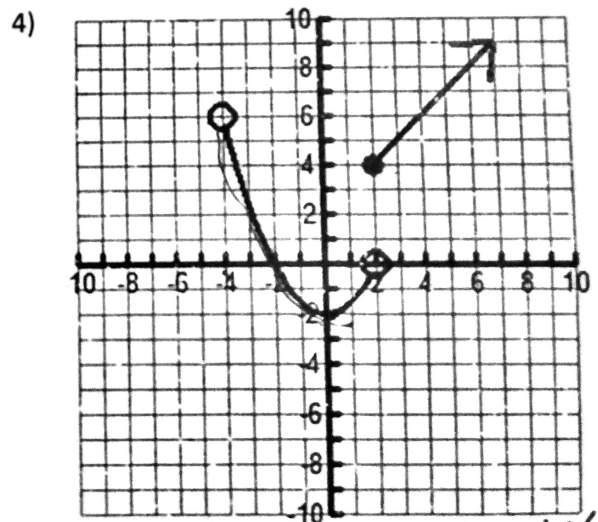
Domain: $x = \mathbb{R}$
 Range: $y < 9$
 Increasing: $x < 0 \cup 1 < x < 4$
 Decreasing: $0 < x < 1 \cup x > 4$



Domain: $x = \mathbb{R}$
 Range: $y = \mathbb{R}$
 Increasing: $x < 0 \cup 2 < x < 4$
 Decreasing: $-\infty < x < 0 \cup x > 4$
 $4 < x < 10$



Domain: $x = \mathbb{R}$
 Range: $y \geq -5$
 Increasing: $-4 < x < 0 \cup x > 4$
 Decreasing: $-\infty < x < -4 \cup 0 < x < 4$



Domain: $x > -4$
 Range: $y \geq -2$
 Increasing: $0 < x < 2 \cup x > 2$
 Decreasing: $-4 < x < 0$

#5-10 Graph each of the following piecewise functions on a separate piece of graph paper.

5) $f(x) = \begin{cases} 3x - 2 & x < -2 \\ x^2 - x + 4 & x \geq -2 \end{cases}$

-2	-8
-3	-11
-4	-14

open

-2	10
-1	6
0	4
1	4
2	6

closed

6) $f(x) = \begin{cases} 3x + 3 & x \leq 0 \\ -x + 4 & 0 < x < 3 \\ x^2 & x \geq 3 \end{cases}$

7) $f(x) = \begin{cases} x - 2 & x < -2 \\ x^3 & -2 \leq x \leq 2 \\ 3x - 5 & x > 2 \end{cases}$

-2	-4
-3	-5
-4	-6

open

-2	-8
-1	-1
0	0
1	1
2	8

closed

2	1
3	4
4	7
5	10

open

8) $f(x) = \begin{cases} 3x - 2 & x < -2 \\ -1 & -2 \leq x < 3 \\ x - 2 & 3 \leq x < 4 \\ 0 & x \geq 4 \end{cases}$

9) $f(x) = \begin{cases} -6 & x < 1 \\ 3x & 1 \leq x \leq 4 \\ 2x - x^2 & x > 4 \end{cases}$

10) $f(x) = \begin{cases} 3x - 1 & x < 0 \\ 2x^2 & 0 \leq x < 4 \\ 1 - x & x \geq 4 \end{cases}$

11) You are a buyer for a grocery store and you are asked to purchase potatoes. The potato farmer tells you that if you buy up to 50 bushels of potatoes, you will pay \$40/bushel. Then for each bushel you purchase above 50 bushels, you will pay \$30/bushel.

a) How much will you pay in total if you decide to purchase 40 bushels? 60 bushels? 78 bushels? 105 bushels?

b) Write a piecewise function that represents the total amount of money that your grocery store will pay for the potatoes.