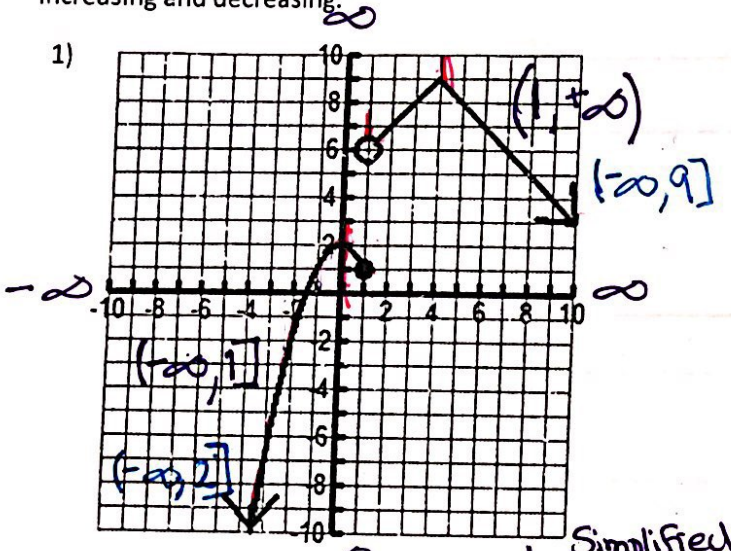
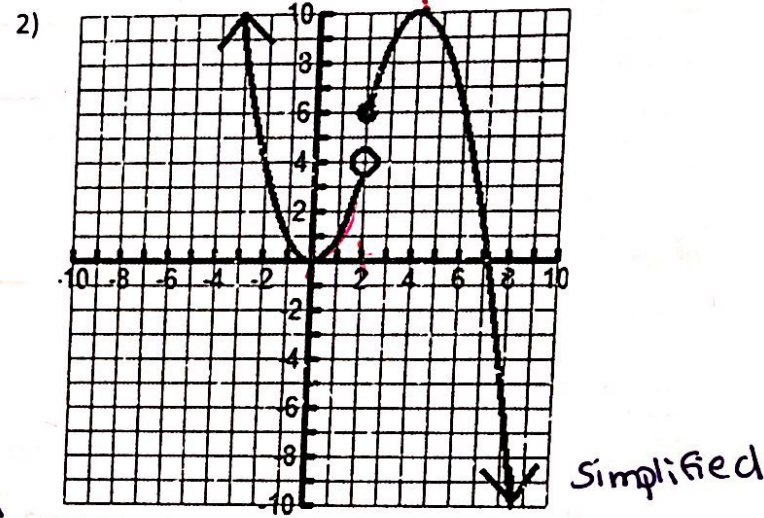


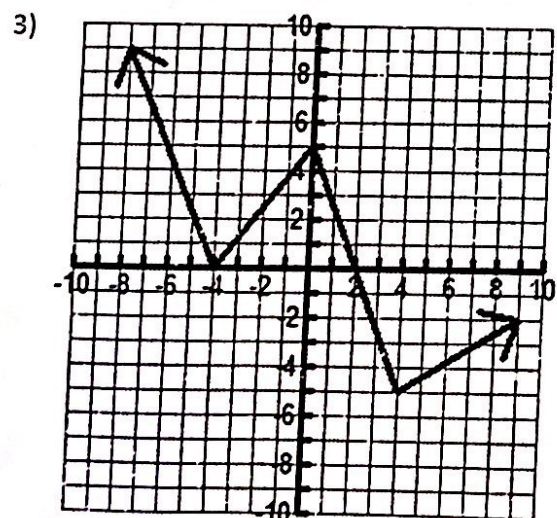
For #1-4, State the domain and range for the function, then determine for what values of the domain the function is increasing and decreasing.



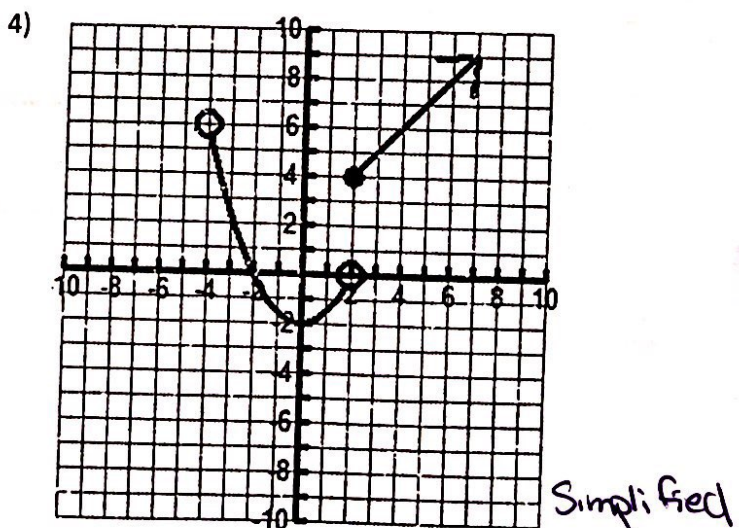
Domain: $(-\infty, 1] \cup (1, \infty)$ | $(-\infty, +\infty)$
 Range: $(-\infty, 2] \cup (2, 9]$ | $(-\infty, 9]$
 Increasing: $(-\infty, 0) \cup (1, 4)$ |
 Decreasing: $(0, 1) \cup (4, \infty)$ |



Domain: $(-\infty, 2) \cup [2, +\infty)$ | $(-\infty, +\infty)$
 Range: $(-\infty, 10] \cup [0, \infty)$ | $(-\infty, +\infty)$
 Increasing: $(0, 2) \cup (2, 4)$ |
 Decreasing: $(-\infty, 0) \cup (4, +\infty)$ |



Domain: $(-\infty, +\infty)$
 Range: $[-5, +\infty)$
 Increasing: $(-4, 0) \cup (4, +\infty)$ |
 Decreasing: $(-\infty, -4) \cup (0, 4)$ |



Domain: $(-4, 2) \cup [2, +\infty)$ | $(-4, +\infty)$
 Range: $[-2, 6) \cup [4, +\infty)$ | $[-2, +\infty)$
 Increasing: $(0, 2) \cup (2, +\infty)$ |
 Decreasing: $(-4, 0)$ |

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

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

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

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

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

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

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

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?

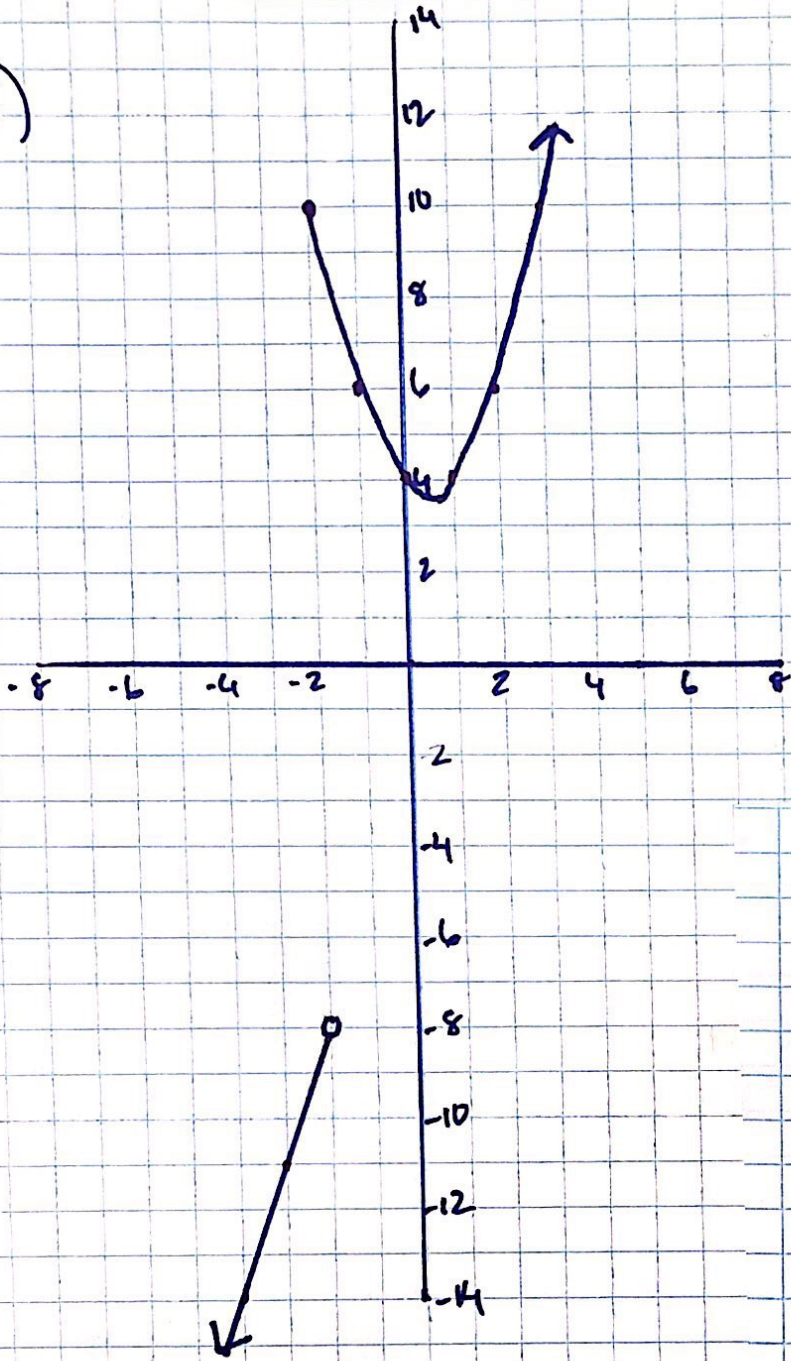
$$40 \rightarrow \$1600 \quad 78 \rightarrow \$2840$$

$$60 \rightarrow \$2300 \quad 105 \rightarrow \$3650$$

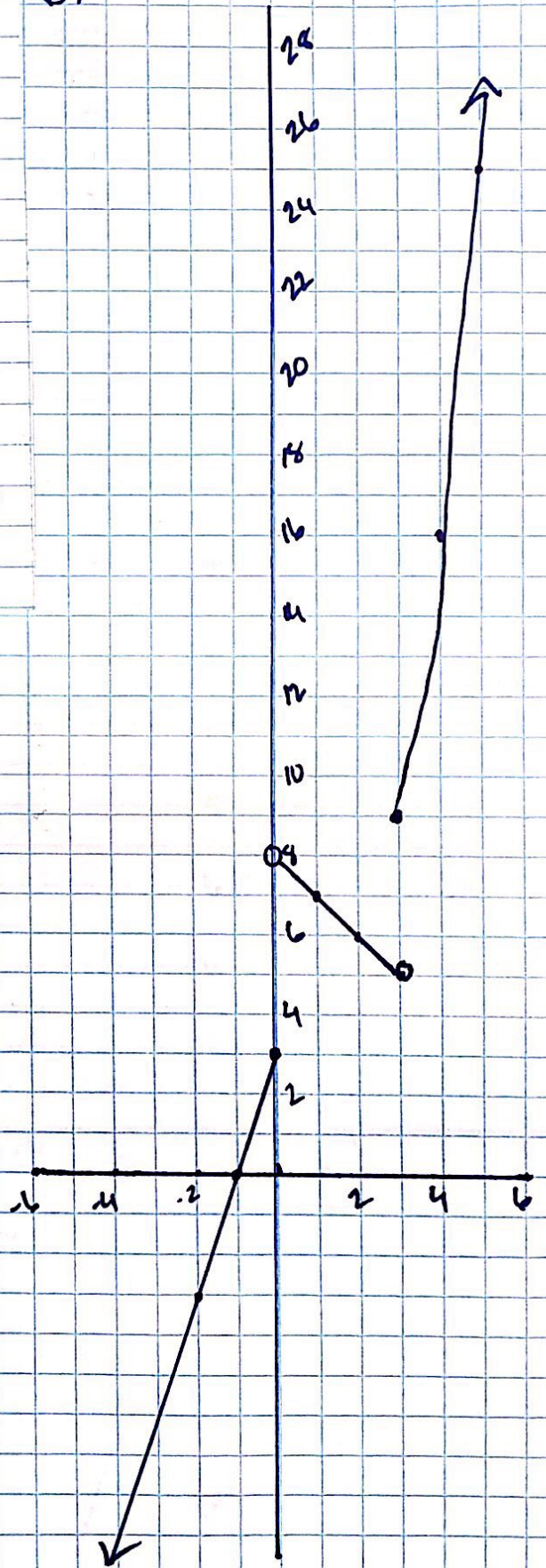
b) Write a piecewise function that represents the total amount of money that your grocery store will pay for the potatoes.

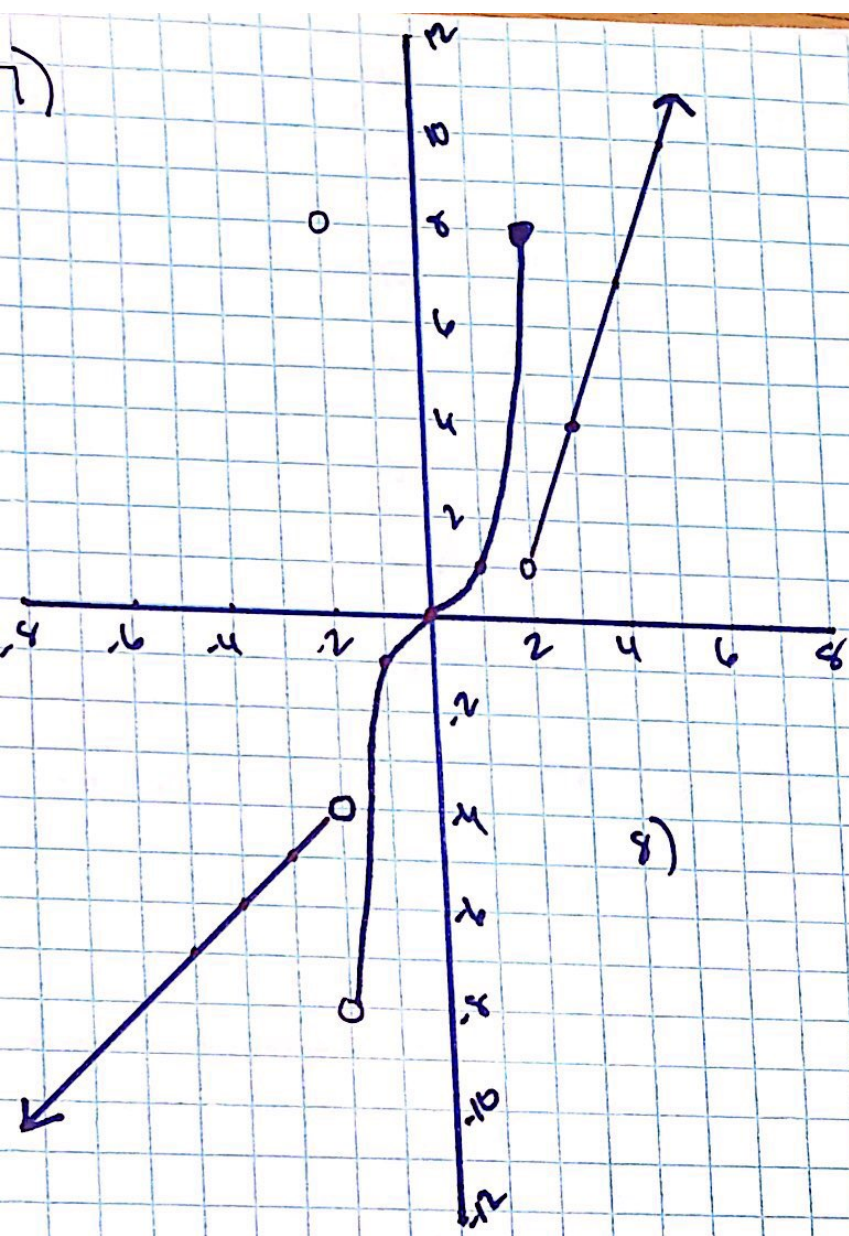
$$f(x) = \begin{cases} 40x & 0 \leq x \leq 50 \\ 2000 + 30(x - 50) & x > 50 \end{cases}$$

5)

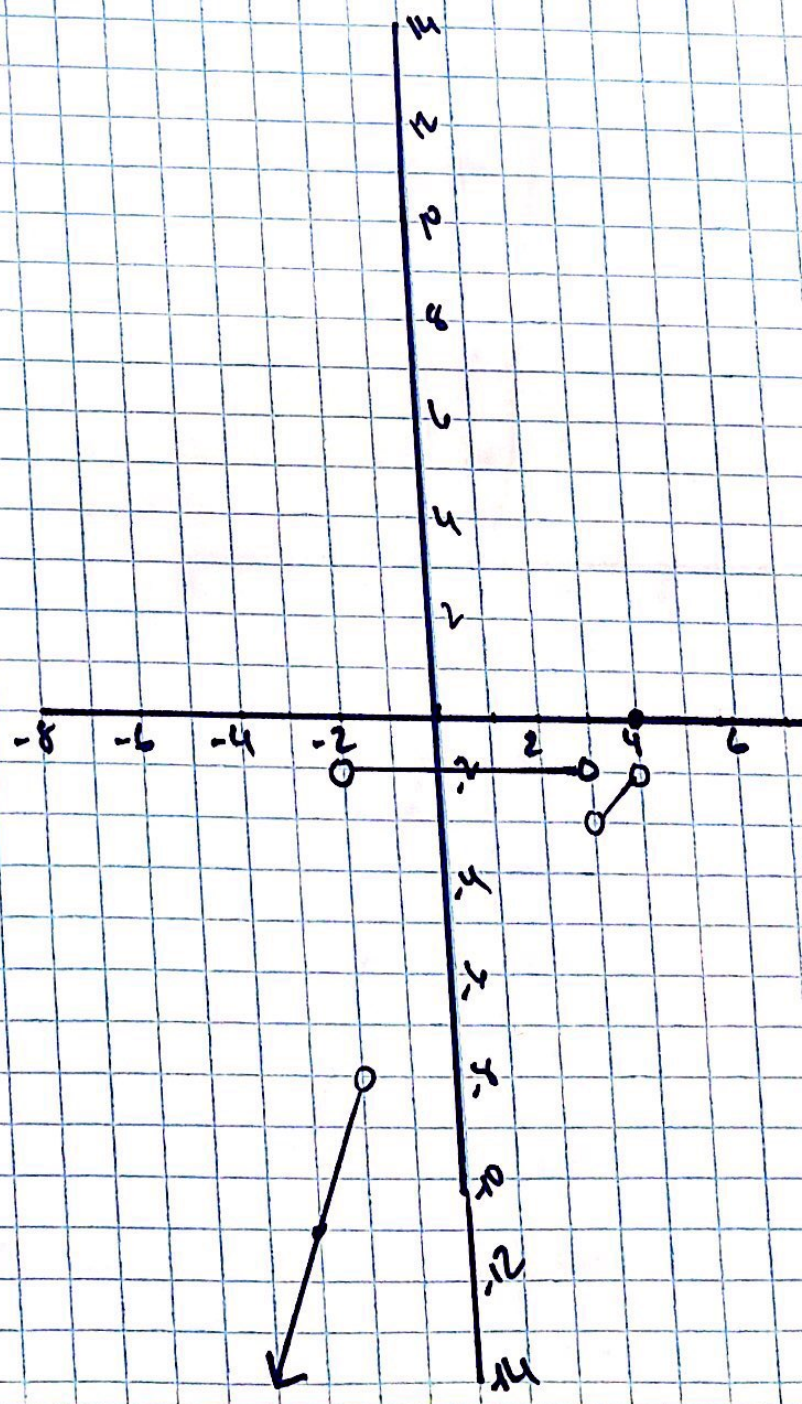


6)



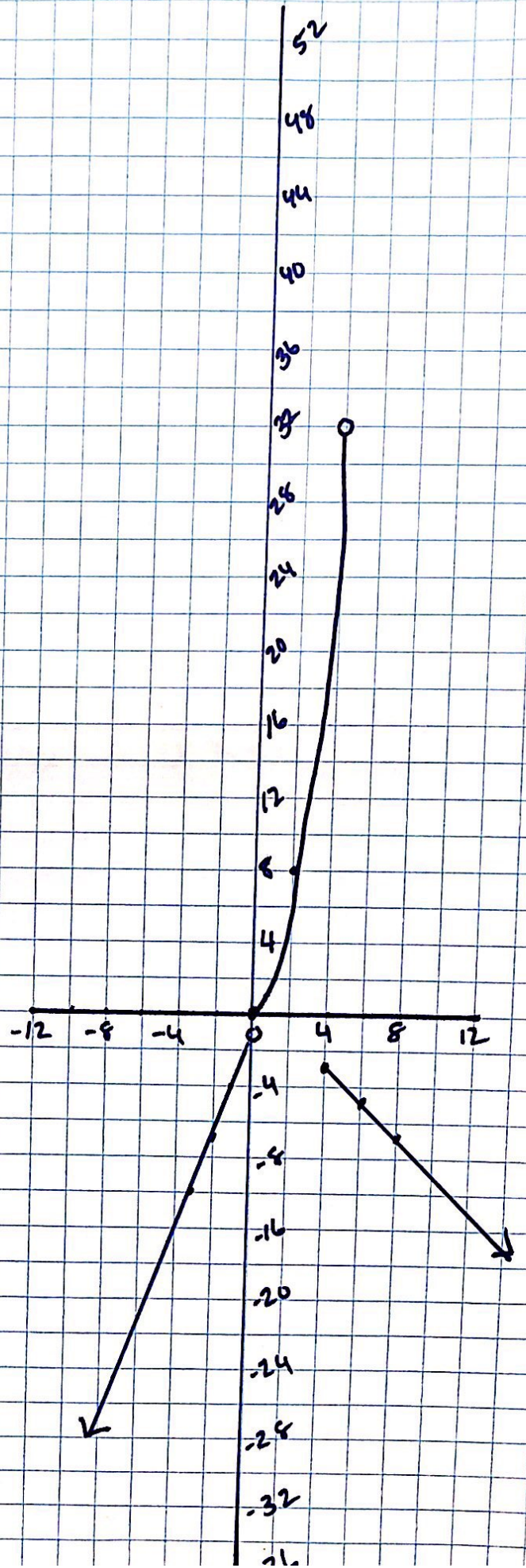
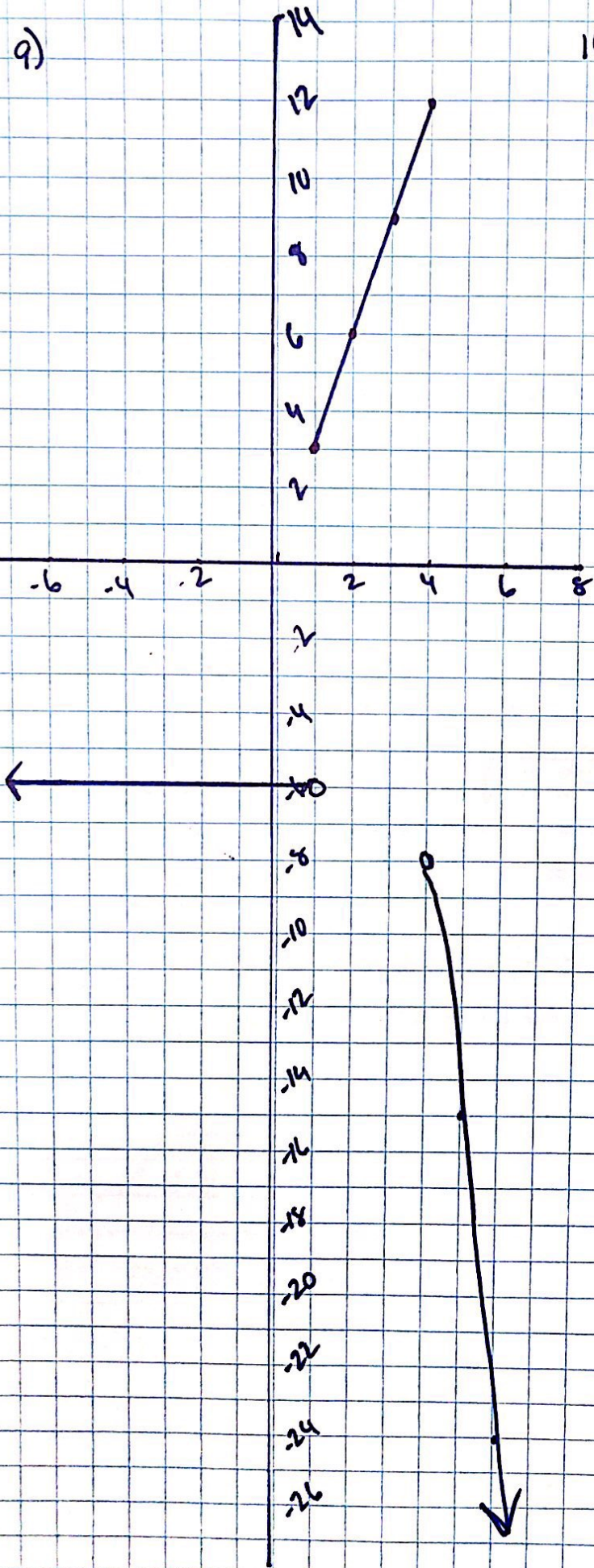


8)



9)

10



ii) x - # of bushels

y - cost

a. 40 \$ 1600

60 $2000 + 10(30) = \$ 2300$

78 $2000 + 28(30) = \$ 2840$

105 $2000 + 55(30) = \$ 3650$

$$b. \quad C(x) = \begin{cases} 40x & 0 < x \leq 50 \\ 500 + 30x & x > 50 \end{cases}$$

$$2000 + 30(x - 50)$$

$$2000 + 30x - 1500$$

$$500 + 30x$$