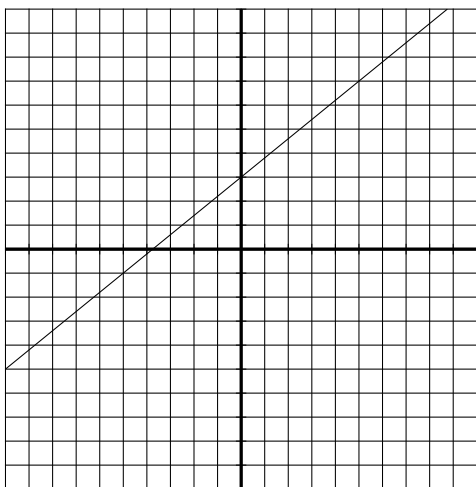


There are 10 problems on this exam. Carefully read and follow all directions. In order to receive credit show all necessary work. No credit will be given for an answer I cannot find or cannot read. All answers should be exact unless specified otherwise.

1. Use the graph of  $y = F(x)$  shown below in standard window to determine the following. (3 points each)



(a)  $y$ -intercept

(b) slope of this line

(c) The equation of this line

(d)  $x$ -intercept

$$A(x) = (x - 4)^2 - 4 \quad B(x) = -\sqrt{x - 4} \quad C(x) = \begin{cases} 4x + 7 & \text{if } x < -4 \\ -2x - 4 & \text{if } -4 \leq x < -1 \\ -7 & \text{if } x \geq -1 \end{cases}$$

2. Describe using shifts and/or reflections how the graph of  $y = x^2$  must be transformed in order to obtain the graph of  $y = A(x)$ . (4 points)

3. Describe using shifts and/or reflections how the graph of  $y = \sqrt{x}$  must be transformed in order to obtain the graph of  $y = B(x)$ . (4 points)

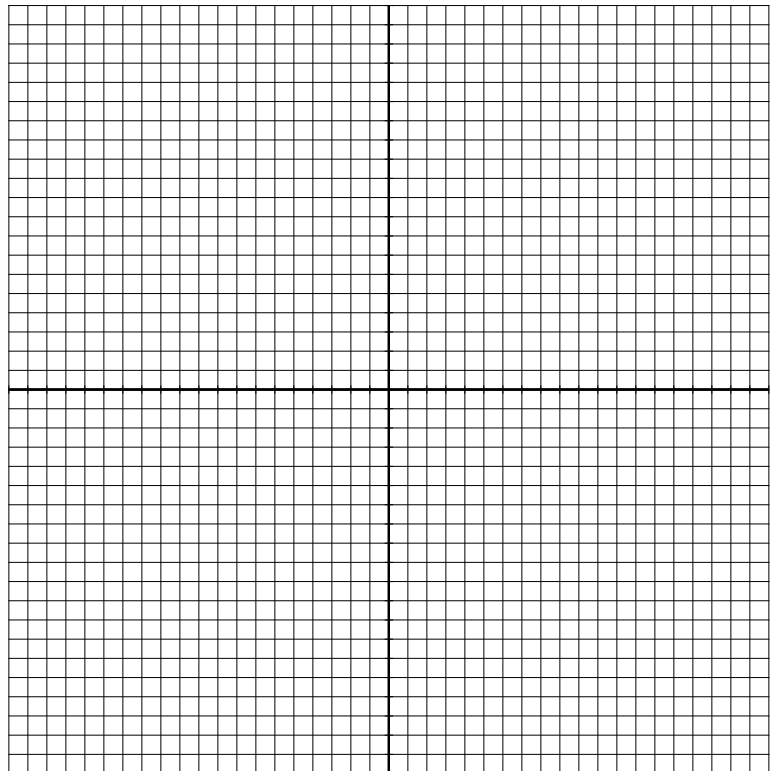
4. Determine each of the following function values. (2 points each)

(a)  $C(0)$

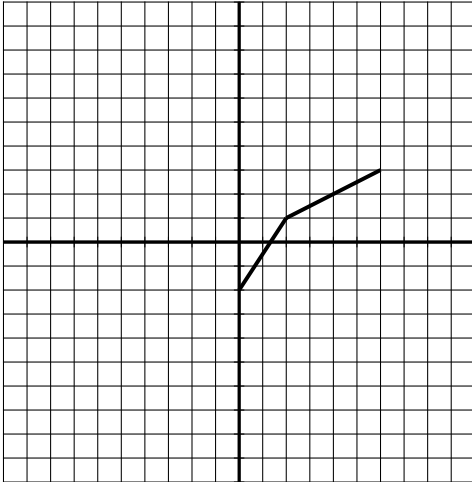
(b)  $C(9)$

(c)  $C(-1)$

5. Graph  $y = C(x)$ . (6 points)



6. Use the graph of the function  $H(x)$  shown below to graph each of the following. Graph the new functions on the grid below. (4 points each)

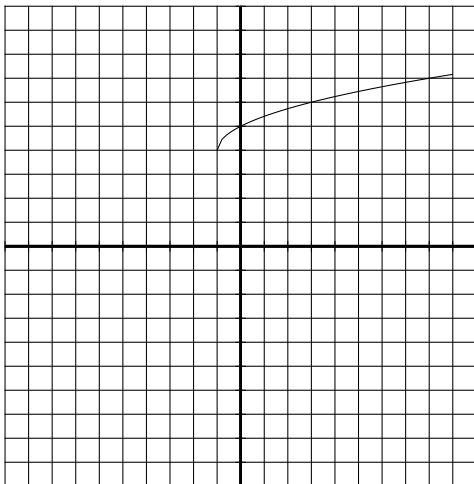


(a) Graph  $y = -H(x - 3)$

(b) Graph  $y = H(-x) - 2$

7. The following graph is a transformation of the graph of  $y = \sqrt{x}$ . Determine what function is graphed below. (4 points)

$y =$  \_\_\_\_\_



8. In parts (a), (b), and (d) give four decimal place accuracy for your values.

(a) Determine the equation of the regression line that best fits the following data points. (4 points)

Year	Sales
1995	\$2980
1997	\$3424
1999	\$3623
2002	\$4239
2005	\$4703

$y =$  \_\_\_\_\_

(b) What is the value of  $r^2$ ? (2 points)

(c) Use the linear model to estimate the sales for 2004? Round the value to the nearest dollar. (3 points)

(d) What is the average rate of change of sales from 1999 to 2005? (3 points)

(e) Show me the graph of the regression line and the data points in an appropriate window on your calculator. (4 points)

9. Suppose  $(6, -9)$  is a point on the graph of  $y = H(x)$ . Determine the following. (3 points each)

(a) What point will be on the graph of  $y = H(\frac{1}{2}x)$ ?

(b) What point will be on the graph of  $y = 2H(x)$ ?

(c) What point will be on the graph of  $y = -H(x - 7)$ ?

(d) What point will be on the graph of  $y = H(-x) - 1$ ?

(e) What point will be on the graph of  $y = H(x + 1) + 4$ ?

(f) What other point will be on the graph of  $y = H(x)$  if the graph is symmetric relative to the  $y$ -axis?

(g) What other point will be on the graph of  $y = H(x)$  if  $H(x)$  is an odd function?

10. Graph the function  $f(x) = 0.00025x^4 + 0.00066x^3 - 0.0315x^2 + 0.0006x + 3$  in the window with  $-20 \leq x \leq 20$  and  $-20 \leq y \leq 20$  and then determine the following. Give all approximate values correct to four decimal places.

(a) Use your calculator to determine the approximate location of the two local minimums on the graph of  $y = f(x)$ . (8 points)

(b) Use your calculator to determine the approximate location of the local maximum on the graph of  $y = f(x)$ . (4 points)

(c) What is the domain of this function? (3 points)

(d) What is the approximate range for this function? (3 points)