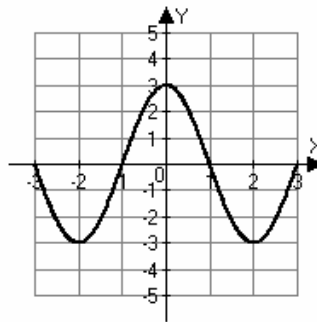


1. Approximate the following for the given function.

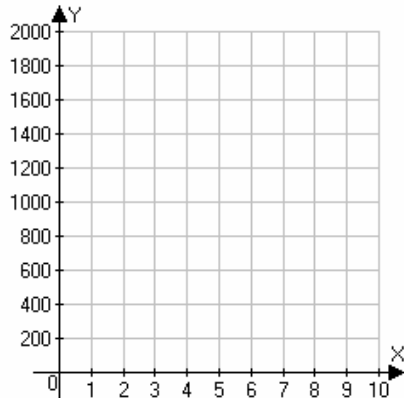
- a. Where is $f(x) = 0$?
- b. Where is $f(x) > 0$?
- c. Where is $f(x) < 0$?
- d. Where is $f(x)$ increasing?
- e. Where is $f(x)$ decreasing?
- f. If $f(x)$ has a maximum, where does the maximum occur and what is the maximum?
- g. If $f(x)$ has a minimum, where does the minimum occur and what is the minimum?



2. The data below shows the annual cost of maintenance (in dollars) for a particular machine as a function of the age of the machine (in years).

Year	1	2	3	4	5	6
Monthly Cost	330	660	990	1320	1650	1980

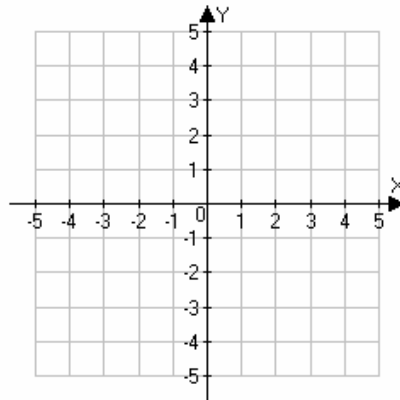
- a) Draw a scatterplot of the data. Would a linear model be a good model? Explain.



- b) Find a linear function can be used to model the cost data.
- c) Find the predicted cost for year 10.
- d) Find the average rate of change of the function from $x_1 = 7$ to $x_2 = 10$. Interpret this value in the context of the problem.
- e) Find $C(0)$ and interpret in terms of the variables in the problem.
- f) Interpret the slope in terms of the variables in the problem.

Graph the following equation

3. $y = -\frac{1}{2}(x+1)+2$



4. The median price of a home in Round Rock, Texas for the years 2004 and 2005 are shown in the table below. Use the data to answer the following questions:

	<i>2003</i>	<i>2004</i>
Round Rock	150,425	151,448

a) Write a linear function that relates cost of a home in Round Rock to the year.

b) Interpret the slope and y-intercept in terms of the variables given.

c) Use the function to estimate the price of a home in Round Rock in 2010.

5. Write a linear equation for the line through the point $(-3,2)$ perpendicular to the line $3x - 4y = 6$.

6. For the function $F(x) = 11.38x + 19.1$, find the value of x for which $F(x) = -1.2$.

Solve the following equation symbolically. Check your solution.

7. $4\left(\frac{1}{2}x - 3\right) - 5\left(x - \frac{1}{2}\right) = 2(3x - 2)$

Solve the following extended inequality symbolically. Express the solution using interval notation. Check your work

$$11. -2 < \frac{1-3x}{3} \leq 5$$

For the following piecewise-defined function answer the questions below: \

- Find the domain of f .
- Evaluate at $x = -2, -1, 0, 1, 2$.
- Sketch a graph.
- Is f continuous?
- Find the values where $f(x) = 0$.

$$12. f(x) = \begin{cases} -3x+1 & -4 < x \leq -1 \\ 2 & -1 < x < 1 \\ 3x-1 & 1 \leq x < 4 \end{cases}$$

Solving the following absolute value equation.

13. $\left|-\frac{1}{3}x - 1\right| = 7$

Solving the following absolute value inequality.

14. $|2x - 5| \leq \frac{1}{3}$

15. Write the function $f(x) = 2x^2 + 3x - 5$ in vertex form and identify the vertex. Find the range of the function.

16. List the transformations used to obtain the graph of $g(x) = -\frac{1}{2}(x-4)^2 - 3$ from $f(x) = x^2$ and draw the graph of g .

17. Put the quadratic function $f(x) = x^2 + 6x - 2$ in vertex form and graph.

a) What transformations are used to transform the graph of $g(x) = x^2$ into this graph?

b) What is the axis of symmetry of the graph of f ?

c) What is the vertex of the graph? Label this clearly

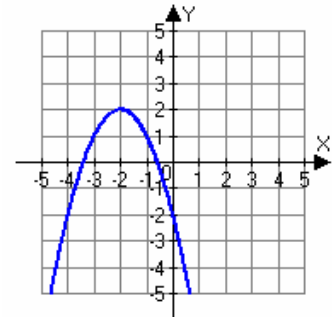
d) The vertex form of the quadratic function

e) Intervals where the function is increasing

f) Intervals where the function is decreasing

18. Use the graph of the quadratic function below to determine the following:

- a) Vertex
- b) Axis of symmetry
- c) Sign of the leading coefficient
- d) The vertex form of the quadratic function
- e) Intervals where the function is increasing
- f) Intervals where the function is decreasing



19. Find values for a , h , and k so that the function $f(x) = a(x - h)^2 + k$ that models the data exactly:

x	0	1	2	3
$f(x)$	-2.5	-3	-2.5	-1

20. If a projectile is launched from the ground with an initial velocity of 896 feet per second, its height is described by $s = -16t^2 + 896t$. If the projectile is launched at time $t = 0$,

a) At what time does it reach its maximum height?

b) What is its maximum height?

c) When does it return to the ground?

d) When is its height 2000 ft?

Solve the following quadratic equations.

21. $2x^2 - 11x = 21$

22. $-6x^2 + 25x - 14 = 0$

23. $3x^2 - 6x + 7 = 0$

24. The graph of $f(x) = ax^2 + bx + c$ is given in the figure below. Solve the equation $ax^2 + bx + c = 0$.

