

COLLEGE ALGEBRA - MAT 140

FALL 2008 - Review 2

Name :.....

I. State whether each statement is **True** or **False** as stated. Provide a clear reason for your answer.

- Every relation is a function
- The graph of a function $y = f(x)$ never crosses the y-axis.
- The y-intercept of the graph of the function $y = f(x)$, whose domain is all real numbers, is $f(5)$.
- The domain of $\left(\frac{f}{g}\right)(x)$ consists of the numbers x that are in the domains of both f and g .
- The average rate of change of a linear function $f(x) = mx + b$ changes with x .

II. Find the domain of the functions

- $g(x) = \frac{x}{x^2 - 16}$
- $q(x) = \sqrt{-x - 2}$

III. Determine whether the graph is of a function or not.

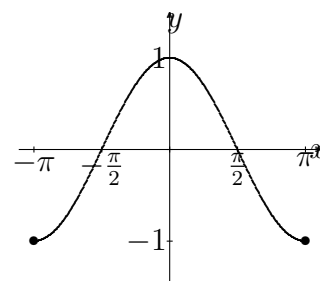
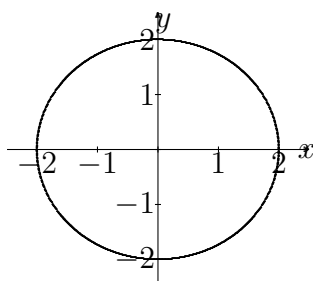
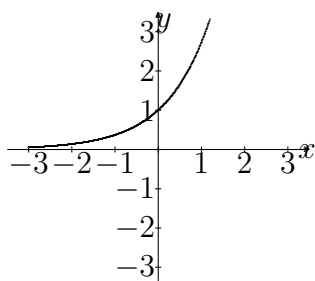


Figure 1:

IV. Use the given graph of the function f , Figure 2, to answer the questions below.

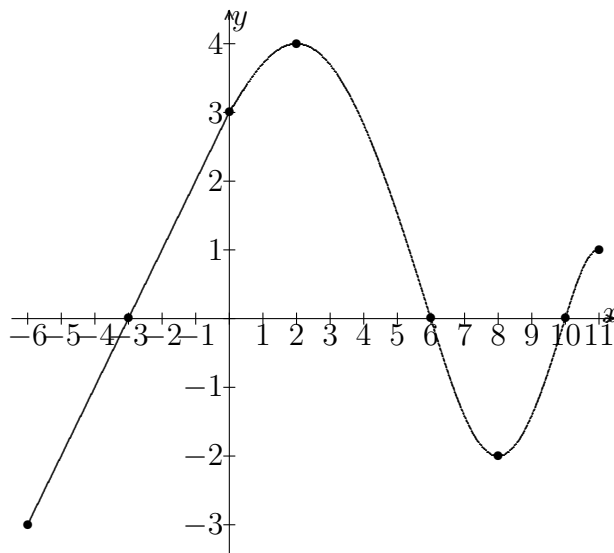


Figure 2:

- Find $f(0)$ and $f(-6)$
- Find $f(3)$ and $f(6)$
- Is $f(3)$ positive or negative?
- Is $f(-4)$ positive or negative?
- For what numbers x is $f(x) = 0$.
- For what numbers x is $f(x) > 0$.
- What is the domain of f ?
- What is the range of f ?
- What are the x-intercepts?
- What is the y-intercept?
- How often does the line $y = \frac{1}{2}$ intersect the graph?
- How often does the line $x = 5$ intersect the graph?
- For what value of x does $f(x) = 3$?
- For what value of x does $f(x) = -2$?

V. Consider the function $f(x) = \frac{2x^2}{x^4 + 1}$.

- Is the point $(-1, 1)$ on the graph of f ?
- If $x = 2$, what is $f(x)$? What point is on the graph of f ?
- If $f(x) = 1$, what is x ? What point(s) are on the graph of f ?
- What is the domain of f ?
- List the x-intercepts, if any, of the graph of f .
- List the y-intercept, if there is one, of the graph of f .

VI. The total private health expenditures H , in billions of dollars, is given by the function $H(t) = 26t + 411$, where t is the number of years since 1990.

- a) What was the total private health expenditure in 2000 ($t=10$)?
- b) In what year will total private health expenditures be \$879 billion?
- c) In what year will total private health expenditures exceed \$ 1 trillion (\$1000 billion)?

VII. Suppose that a company has just purchased a new computer \$3,000. The company chooses to depreciate the computer using the straight line method over 20 years.

- Write a linear function that expresses the book value of the computer a function of its age.
- Graph the linear function
- What is the book value of the computer after 5 years?
- When will the computer be worth \$2,250.

VIII. For the data given in Table 1,

x	-20	-17	-15	-14	-10
y	100	120	118	130	140

Table 1:

- Draw a scatter diagram on Figure 3.
- Use a graphing utility to find the line of best fit.
- Graph the line of best fit on the scatter diagram. (Free hand drawing not acceptable!)



Figure 3:

IX. Match each graph to its function.

A. Cube function

B. Absolute value function

C. Constant function

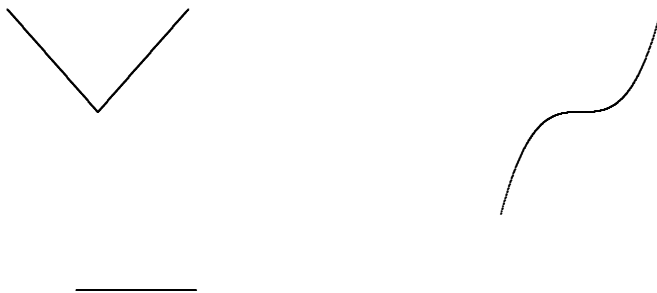


Figure 4: