COLLEGE ALGEBRA - MAT 140

FALL 2008 - EXAM 2

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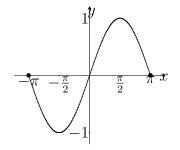
TO RECEIVE FULL CREDIT YOU MUST SHOW YOUR WORK. No notes or books are allowed.

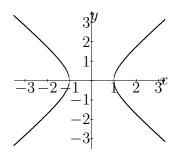
No. 1. (10 points) State whether each statement is **True** or **False** as stated. Provide a clear reason for your answer.

- i) A function can have more than one y-intercept.
- ii) The graph of a function y = f(x) always crosses the y-axis.
- iii) The y-intercept of the graph of the function y = f(x), whose domain is all real numbers, is f(0).
- iv) The domain of $(f \cdot g)(x)$ consists of the numbers x that are in the domains of both f and g.
- v) The average rate of change of a linear function f(x) = mx + b is the constant m.

No. 2. (6 points) Find the domain of the function $f(x) = \frac{x}{\sqrt{x-4}}$.

No. 3. (10 points) Determine whether the graph is of a function or not.





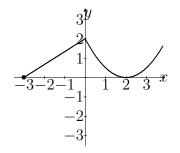


Figure 1:

No. 4. (16 points) Use the given graph of the function f, Figure 2, to answer parts (a)-(k).

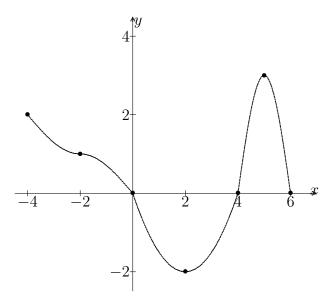


Figure 2:

- a) Find f(0) and f(6)
- b) Is f(3) positive or negative?
- c) For what numbers x is f(x) = 0.
- d) For what numbers x is f(x) < 0.
- e) What is the domain of f?
- f) What is the range of f?
- g) What are the x-intercepts?
- h) What is the y-intercept?
- i) How often does the line y = 1 intersect the graph?
- j) How often does the line x = -2 intersect the graph?
- k) For what value of x does f(x) = 3?

No. 5. (16 points) Consider the function $f(x) = \frac{2x}{x-2}$.

- a) Is the point $(\frac{1}{2}, -\frac{2}{3})$ on the graph of f?
- b) If x = 4, what is f(x)? What point is on the graph of f?
- c) If f(x) = 1, what is x? What point(s) are on the graph of f?

- d) What is the domain of f?
- e) List the x-intercepts, if any, of the graph of f.

f) List the y-intercept, if there is one, of the graph of f.

No. 6. (10 points) The monthly cost C , in dollars, of a certain cellular phone plan is given by the function $C(x) = 0.38x + 5$, where x is the number of minutes used on the phone.
a) What is the cost if you talk on the phone for $x = 50$ minutes?
b) Suppose that your monthly bill is \$29.32. How many minutes did you use the phone?
No. 7. (10 points) Suppose that a company has just purchased a new machine for its manufacturing facility for \$120,000. The company chooses to depreciate the machine using the straight line method over 10 years.
a) Write a linear function that expresses the book value of the machine as a function of its age.
b) Graph the linear function
c) What is the book value of the machine after 4 years?
d) When will the machine be worth \$60,000.

No. 8. (10 points) For the data given in Table 1,

X	3	4	5	6	7	8	9
у	4	6	7	10	12	14	16

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!)

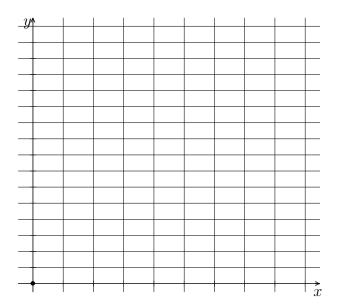


Figure 3:

No. 9. (12 points) Match each graph to its function.

- A. Square root function
- **B.** Cube function
- C. Reciprocal function

- **D.** Absolute value function
- E. Square function
- F. Linear function

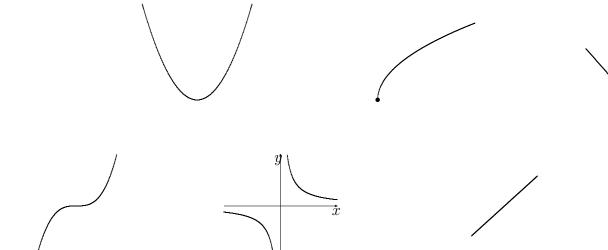


Figure 4: