

SHOW WORK WHENEVER APPROPRIATE. NO CREDIT GIVEN OTHERWISE. ANSWER MUST BE CIRCLED.

Evaluate the symbolic representation  $f(x)$  at the given value of  $x$ .

1) a) Evaluate  $f(x) = \sqrt{x}$  for  $x = \frac{4}{9}$

b) Find  $f(9)$

c) What is  $x$  when  $f(x) = 8$ ?

d) What numbers can you put in place of  $x$ , and get real number answers?

e) What is the domain of the function?

f) What types of numbers are the answers to the expression  $\sqrt{x}$ ? Circle all that apply  
Positive real numbers                      Negative real numbers                      Zero

g) What is the range of the function?

h) Explain why this is a function.

Answer the question.

2) Which of the following correctly defines a function?

- A) A function produces exactly one output for each valid input.
- B) A function is a relation for which the range contains only unique values.
- C) A function is a set of points that can be graphed on a cartesian graph.
- D) A function is a relation that transforms input numbers into output numbers.

Simplify the expression. Use positive exponents. Assume the variable is not zero.

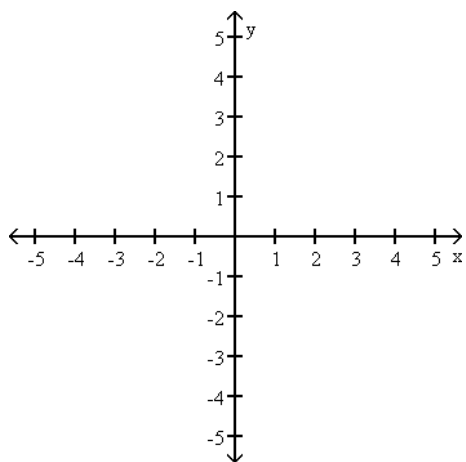
3)  $\frac{x^{-8}}{(7x)^{-8}}$

Evaluate the expression using a calculator.

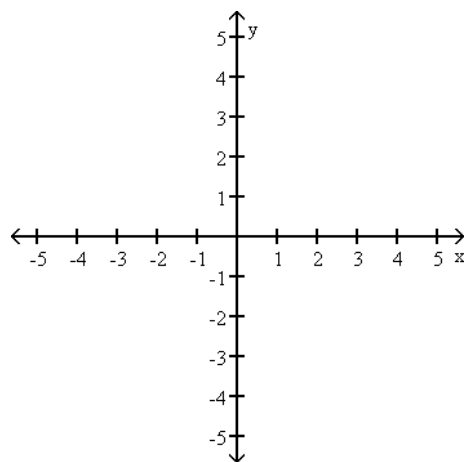
4)  $\frac{1}{12} + \left( \frac{4}{9} \div \frac{1}{3} \right)$

5) Sketch the graph of

a) A relation which is not a function

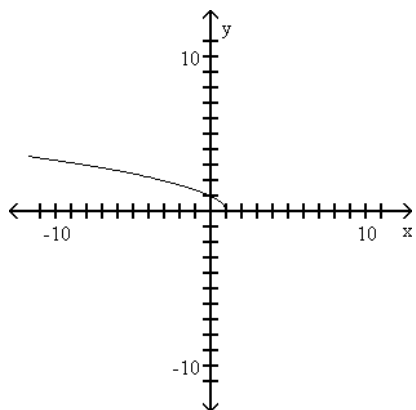


b) A relation which is a function



a) Find the domain and the range of the function  $y = f(x)$  graphed below.

6)



A) D:  $x \leq 1$ , R:  $y \geq 0$

B) D:  $x < 1$  or  $x > 1$ , R:  $y < 0$  or  $y > 0$

C) D:  $x < \sqrt{1}$ , R:  $y \leq 0$

D) D: All real numbers, R:  $y \geq 0$

4-b) Explain why this is the graph of a function.

4-c) Use the graph to find  $f(0)$

4-d) Use the graph to solve  $f(x) = 0$

4-d) Use the graph to solve  $f(x) = -3$

Solve.

- 7) If  $P$  dollars is deposited in a savings account paying  $r\%$  annual interest, then the amount  $A$  in the account after  $x$  years is given by  $A = P\left(1 + \frac{r}{100}\right)^x$ . Find the amount in the account after 5 years if we deposit \$250, at a rate of 3%.

Use properties of exponents to simplify. Assume the variables are not zero. Write answers with positive exponents.

8)  $\left(\frac{-3x}{y^4}\right)^{-3}$

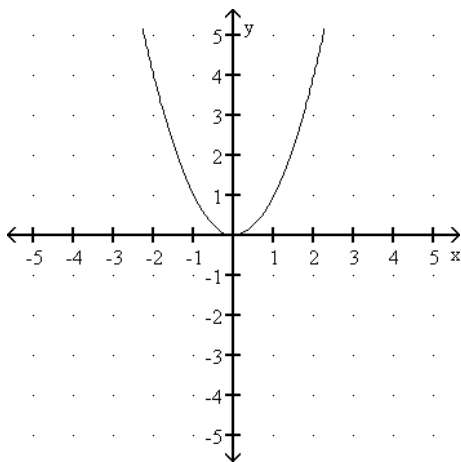
For the given graph, answer the questions.

- 9) a) Is it a function?      YES      NO      EXPLAIN

b) Find  $f(0)$ .

c) Solve  $f(x) = 1$

d) Solve  $f(x) = -1$



e) Give the domain and range of the relation

For the given expression:

10)  $f(x) = \frac{x}{x-5}$

- a) Is it a function?      YES      NO      EXPLAIN

b) What is the domain? (What numbers can you put in place of  $x$  and get answers for  $f(x)$ ?)

c) Use the calculator to find  $f(2/3)$