Math 103 – Cumulative Review 2 – Chapter 1 and 2.1 **Name**_____

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 $x=\frac{4}{9}$ $f(\frac{4}{9})=\sqrt{\frac{4}{9}}=\frac{2}{3}$

b) Find f(9) $=\sqrt{9}=3$

c) What is x when f(x) = 8? $f(x)=\sqrt{x} \Rightarrow 8=\sqrt{x} \Rightarrow x=64$

d) What numbers can you put in place of x, and get real number answers? $x\geq 0$

e) What is the domain of the function? $x\geq 0$

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? $y\geq 0$

h) Explain why this is a function. For every input there is only one output
Passes the Vertical Line test

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

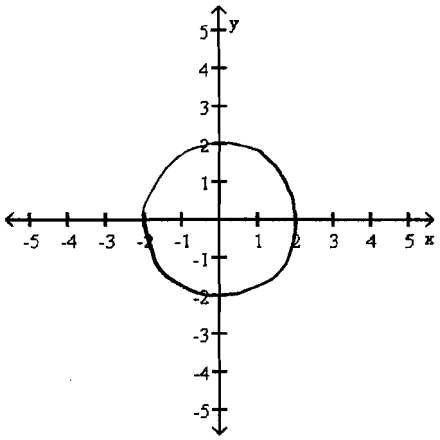
Evaluate the expression using a calculator.

4) $\frac{1}{12}+\left[\frac{4}{9}\div\frac{1}{3}\right] = (1\div 12)+((4\div 9)\div(1\div 3)) = \frac{17}{12}$

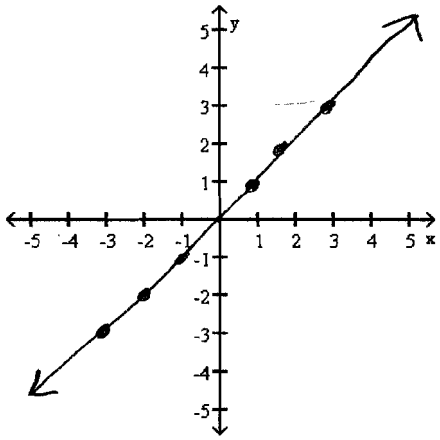
OR 1.41666667

5) **Sketch the graph of**

a) A relation which is not a function

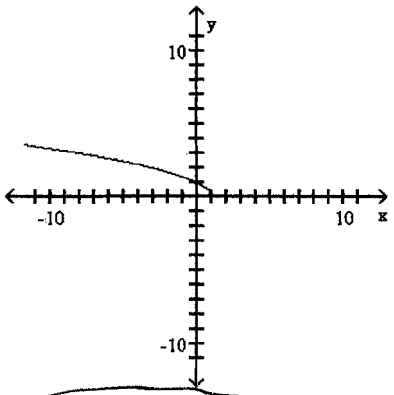


b) A relation which is a function



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

6)



Domain $x \leq 1$

Range $y \geq 0$

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. For every input there is only one output

4-c) Use the graph to find f(0) When $x = 0$ y is 1 $f(0) = 1$

4-d) Use the graph to solve f(x) = 0 When $y = 0$ x is 1

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

y is never -3

So, No solution

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 $A = P(1 + \frac{r}{100})^x$. Find the amount in the account after 5 years if we deposit \$250, at a rate of 3%.

$A = 250(1 + \frac{3}{100})^5 = \$289.82$

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

8) $\left(\frac{-3x}{y^4}\right)^{-3} = \left(\frac{y^4}{-3x}\right)^3 = \frac{y^{12}}{-27x^3}$

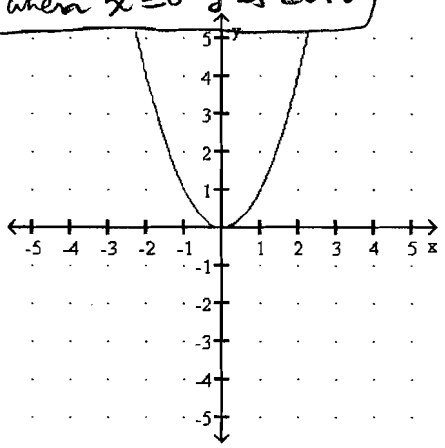
For the given graph, answer the questions.

9) a) Is it a function? (YES) NO EXPLAIN For every input there is only one output Passes the Vertical line test

b) Find f(0). = 0 when x = 0 y is zero

c) Solve f(x) = 1 when x = 1 OR x = -1 y is 1

d) Solve f(x) = -1 No Solution



e) Give the domain and range of the relation Domain: $\mathbb{R}$ Range $y \geq 0$

For the given expression:

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

a) Is it a function? (YES) NO EXPLAIN Passes the Vertical line test

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

Domain is All Reals except $x = 5$

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

$\frac{(\frac{2}{3})}{((\frac{2}{3})-5)} = -\frac{2}{13}$