Math-110 College Algebra
Fall 2007
9/06/07

Note: Show all work. Correct answers without support will receive at most half credit. Incorrect answers without support will receive no credit.

Name: Solution Guide

Quiz 2

#1 Determine the domain of the function:

$$f(x) = \sqrt{x-2} + \frac{\sqrt{x+1}}{x-3}$$

in interval notation.

We can't take $\sqrt{\ }$ of a negative. So,

$x-2 \geq 0$ and $x+1 \geq 0$

$\Longrightarrow x \geq 2$ and $x \geq -1$

We can't divide by zero. Therefore,

$x \neq 3$.

So, $x \geq 2$ and $x \geq -1$ and $x \neq 3$. In interval notation:

$\boxed{D: [2,3) \cup (3,\infty).}$

#2 Determine algebraically whether or not the following functions are even, odd, or neither even nor odd.

a.
$$f(x) = \frac{x^5}{|x|+2}$$

b.
$$f(x) = |x-2|$$

c.
$$f(x) = x^{4/3} + x^2 + 2$$

a.) $f(-x) = \dfrac{(-x)^5}{|-x|+2} = \dfrac{-x^5}{|x|+2} = -\dfrac{x^5}{|x|+2} = -f(x)$

f is an odd function.

b.) $f(-x) = |-x-2| = |(-1)(x+2)| = |-1||x+2| = |x+2|$

f is neither even nor odd.

c.) $f(-x) = (-x)^{4/3} + (-x)^2 + 2 = \sqrt[3]{(-x)^4} + x^2 + 2 = \sqrt[3]{x^4} + x^2 + 2 = f(x)$.

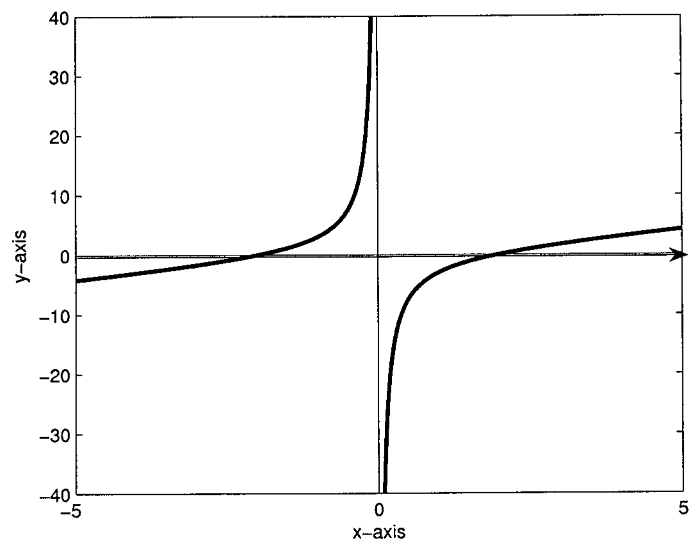
f is an odd function.

2 The graph of the function:

$$g(x) = \frac{x^2 - 4}{x}$$

is shown below.

a. Determine the x-intercepts.
b. In interval notation, determine the intervals over which the function is increasing.
c. In interval notation, determine the intervals over which the function is negative and the intervals over which it is positive.
d. Determine the domain of the function in interval notation.
e. Determine the range of the function in interval notation.



a.) $x^2 - 4 = 0$
$\Rightarrow x^2 = 4$
$\Rightarrow x = \pm 2$
The x-intercepts are ± 2.

b.) $(-\infty, 0)$

c.) <u>Negative</u>: $(-\infty, -2) \cup (0, 2)$
<u>Positive</u>: $(-2, 0) \cup (2, \infty)$

d.) D: $(-\infty, 0) \cup (0, \infty)$

e.) R: $(-\infty, \infty)$