MATH 140, Section K2
September 11, 2009

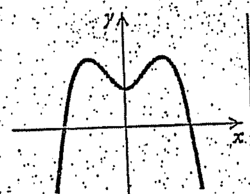
Quiz #3

Name: Key

READ AND FOLLOW ALL DIRECTIONS. CIRCLE YOUR FINAL ANSWERS. SHOW ALL WORK TO RECEIVE FULL CREDIT. NO CALCULATORS. DUE M 9/14

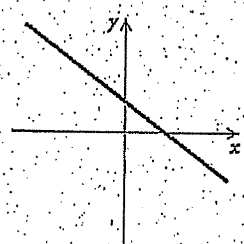
1. (2 points each) Determine whether the function given is odd, even, or neither. You must provide an accurate reason to receive credit.

(a)



Even The graph is symmetric with respect to the y-axis

(b)



Neither The graph is neither symmetric with respect to the origin nor the y-axis

(c) $f(x) = -\frac{4}{x}$

$f(-x) = -\frac{4}{-x} = \frac{4}{x} = -\left(-\frac{4}{x}\right) = -f(x)$

the function $f(x)$ is odd

(d) $g(x) = \sqrt{x^2+1}$

$g(-x) = \sqrt{(-x)^2+1} = \sqrt{x^2+1} = g(x)$

the function $g(x)$ is even

2. (2 points) Identify the domain of $f(x) = \frac{1}{\sqrt{5x-5}}$.

dom $f = \{x \mid x > 1\}$ or all real numbers greater than 1,

Quiz #3

3. (10 points) Consider the piecewise-defined function

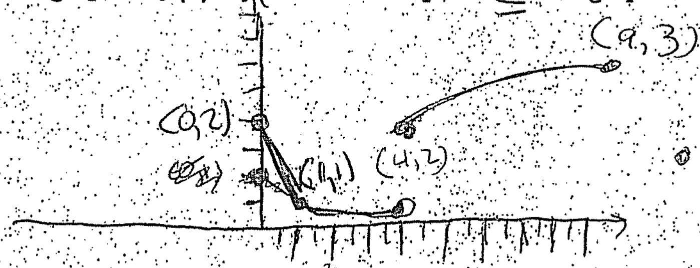
$$f(x) = \begin{cases} 2-x & \text{if } 0 \le x < 1 \\ \frac{1}{x} & \text{if } 1 \le x < 4 \\ \sqrt{x} & \text{if } 4 \le x \le 9 \end{cases}$$

2 (a) Find $f(1)$ and $f(4)$.

$f(1) = \frac{1}{1} = 1$

$f(4) = \sqrt{4} = 2$

4 (b) Sketch the graph of $f(x)$. Label at least 4 points on the graph.



scale: 1/2 unit

- accept labels off to the side.

2 (c) Find the interval(s) on which f is decreasing.

$f(x)$ is decreasing on $(0,4)$

2 (d) Find the interval(s) on which f is increasing.

$f(x)$ is increasing on $(4,9)$

2 (e) Does $f(x)$ have a local maximum or local minimum? If yes, identify them; if not, explain.

~~f(x) has a local max at c=9 (local max c=9) (local min) OR f(x) has no local max and no local~~

4. (2 points) EXTRA CREDIT. Name a function $f(x)$ which is both even and odd. To receive credit, prove that your function IS both even and odd.

$f(x) = 0$ is a function which is both even and odd

$f(-x) = 0 = f(x)$ so $f(x)$ is even

$f(-x) = 0 = -0 = -f(x)$ so $f(x)$ is also odd.

(e) Either: f has a local max at x=0 and at x=9 and no local minimum

OR f has no local max or local min