235 EXAM 0

You may use your notebook during the last ten minutes of this exam.

You may NOT use calculators, cell phones, loose papers, or peeking.

Small numbers to the right of the problems indicate similar homework exercises.

Math 235
January 28, 2013

Name: *key* V1

By printing my name I pledge to uphold the honor code.

1. Determine whether each of the following is true or false. *0.5 #11-16, #17-46*

10 pts

-2 until the pts run out

T **F** For all real numbers x, there is some real number y with $y = x^2$.

T F There is some real number y such that for all real numbers x we have $y = x^2$.

T F There exist real numbers $x < 0$ and $y < 0$ such that $xy < 0$.

T F For any real number x, if $|x^2 - 5| < 0.2$, then $|x^2 - 5| < 0.1$.

T **F** If $0 < |x - 3| < 0.05$, then $|x - 3| < 0.1$.

T **F** $0 < |x - 3| < 0.05$ if and only if $x \in (2.95, 3) \cup (3, 3.05)$.

2. Find the domain of the function

$$f(x) = \frac{\sqrt{x^2 - 4}}{x - 7}.$$

Show your work clearly so I can see how you arrived at your answer. *0.1 #33-42*

10 pts

$$\begin{cases} x^2 - 4 \geq 0 \\ x - 7 \neq 0 \end{cases} \Rightarrow \begin{cases} x \geq 2 \text{ or } x \leq -2 \\ x \neq 7 \end{cases}$$

$$\boxed{(-\infty, -2] \cup [2, 7) \cup (7, \infty)}$$

TURN OVER →

3. Fill in the blanks with the appropriate answers. *0.2 #4,5,16,35*

10 pts

-2 until whenever

a) If the point $(1, -4)$ is on the graph of $y = f(x)$, then the point $\boxed{(\frac{1}{2}, -5)}$ is on the graph of $y = f(2x) - 1$.

b) If $f(x)$ is $\boxed{\text{an odd function}}$ and the point $(-2, 3)$ is on the graph of $y = f(x)$, the the point $\boxed{(2, -3)}$ must also be on the graph of $f(x)$.

c) If the point $\boxed{(-2, 3)}$ is on the graph of $y = f(x)$, then the point $(3, -2)$ is on the graph of $y = f^{-1}(x)$.

d) If $f(0) = 3$, $f(1) = 2$, $f(2) = 0$, and $f(3) = 1$, then $(f \circ f \circ f)(1) = \boxed{3}$.

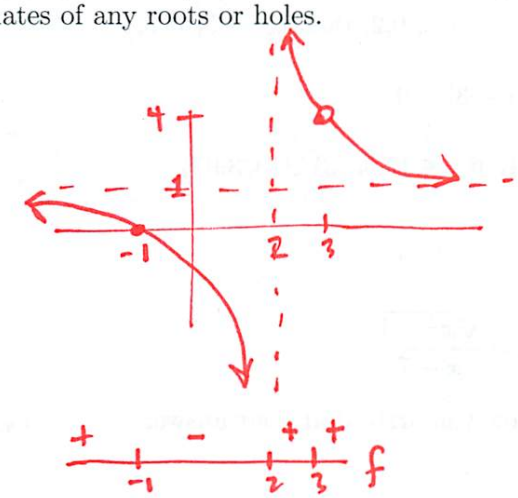
$f(f(f(1))) = f(f(2))$
$= f(0) = 3$

4. Sketch a rough graph of the function

$$f(x) = \frac{(x+1)\cancel{(x-2)}\cancel{(x-3)}}{(x-2)^{\cancel{2}}\cancel{(x-3)}}. = \frac{(x+1)}{x-2}, \text{ for } x \neq 3$$

Clearly label any horizontal or vertical asymptotes, and explicitly label the coordinates of any roots or holes. *0.3 #53*

10 pts



pos/neg
hole at $x=3$
root at $x=-1$
h.a. at $y=1$
v.a. at $x=2$

2 pts each

height of hole is
$\frac{3+1}{3-2} = \frac{4}{1} = 4$

5. For each quantity below circle ONE of the following. *0.4 #33-44*

10 pts

-2 until whenever

The quantity $\sin^{-1}(2)$ is:	(positive)	(negative)	(zero)	(undefined)
The quantity $\tan(-\frac{5\pi}{4})$ is:	(positive)	(negative)	(zero)	(undefined)
The quantity $\ln(\frac{1}{2})$ is:	(positive)	(negative)	(zero)	(undefined)
The quantity $e^{-2.5}$ is:	(positive)	(negative)	(zero)	(undefined)