Quiz 1
Math 251

Name: KEY

Show *all* your work (algebraically or geometrically) for each and simplify. No credit is given without supporting work.

1. [2] Simplify *if* possible:

$\frac{x^2+3x+2}{x^2-x-2}$ $\qquad$ $\frac{1+TC}{C}$ $\qquad$ $\frac{\frac{y}{x}-\frac{x}{y}}{\frac{1}{y}-\frac{1}{x}}$

$\frac{(x+1)(x+2)}{(x+1)(x-2)}$ $\qquad$ $\frac{1}{C}+\frac{TC}{C}$ $\qquad$ $\frac{(y+x)(y-x)}{xy} \cdot \frac{xy}{-(y+x)x}$

$\frac{x+2}{x-2}$ $\qquad$ $\frac{1}{C}+T$ $\qquad$ $= -(y+x)$

+1/3 $\qquad$ +1/3 $\qquad$ +1

2. [2] Evaluate:

$\sin\frac{7\pi}{6}$ $\qquad$ $16^{-\frac{3}{4}}$

$-\frac{1}{2}$ $\qquad$ $\frac{1}{16^{\frac{3}{4}}} = \left(\frac{1}{\sqrt[4]{16}}\right)^3 = \frac{1}{2^3} = \frac{1}{8}$

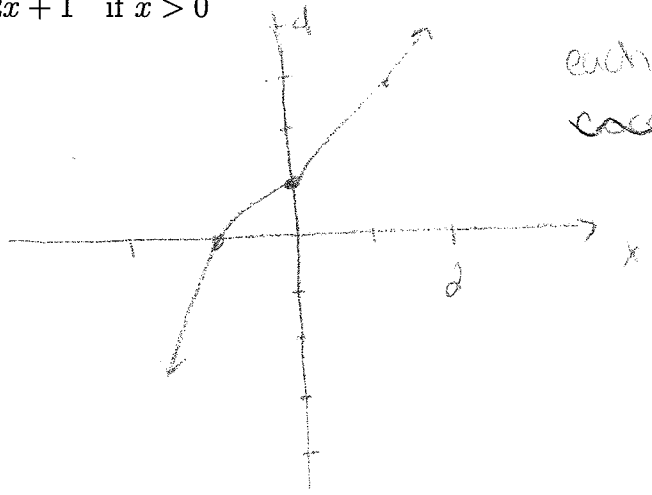
+1/2 $\qquad$ +1/2

$\log_5 125 = \log_5 5^3 = 3$ $\qquad$ $\arcsin\left(\frac{\sqrt{3}}{2}\right)$ $\qquad$ $\pi/3$

$\frac{3}{5}$ $\qquad$ +1/2 $\qquad$ +1/2

$125 = 5^3$

3. [2] Let $f(x) = \begin{cases} 1 - x^2 & \text{if } x \leq 0 \\ 2x + 1 & \text{if } x > 0 \end{cases}$. Sketch the graph of f.



each graph +1
each piece +1

4. [4] Given $f(x) = x^3$ and $g(x) = 2x - 3$, find and simplify the following:

$g(\beta + 2)$ $\qquad$ $(g \circ f)(x) = g(f(x))$ $\qquad$ $\dfrac{f(2+h) - f(2)}{h}$

$2(\beta+2)-3 = 2\beta+4-3 = 2\beta+1$ +1

$2(x^3)-3$ $\quad 2x^3-3$ +1

$\dfrac{(2+h)^3 - 2^3}{h}$

+1

$\dfrac{8 + 3\cdot 2^2 h + 3\cdot 2 h^2 + h^3 - 8}{h}$

$\dfrac{h(12 + 6h + h^2)}{h}$

$12 + 6h + h^2$ +1