Math 25 Calculus I Quiz 1
Sept 6, 2005 SHOW ALL WORK

1.) Let $f(x) = \frac{x}{x+2}$. Calculate the following. Simplify your answer.

i.) $f(x+3) =$ $\frac{x+3}{x+5}$

$f(x+3) = \frac{x+3}{x+3+2} = \frac{x+3}{x+5}$.

ii.) $f^{-1}(x) =$ $\frac{2x}{1-x}$

$y = \frac{x}{x+2}$

Switch x and y: $x = \frac{y}{y+2}$

Solve for y: $x(y+2) = y$

$xy + 2x = y$

$2x = y - xy$

$2x = y(1-x)$

$y = \frac{2x}{1-x}$

iii.) State the domain of f: $\mathcal{R} - \{-2\}$

iv.) State the range of f: $\mathcal{R} - \{1\}$

Note range of f = domain of f^{-1}. Hence your answer to iv.) will depend on your answer to ii.) We will grade iv.) based on your answer to ii.)

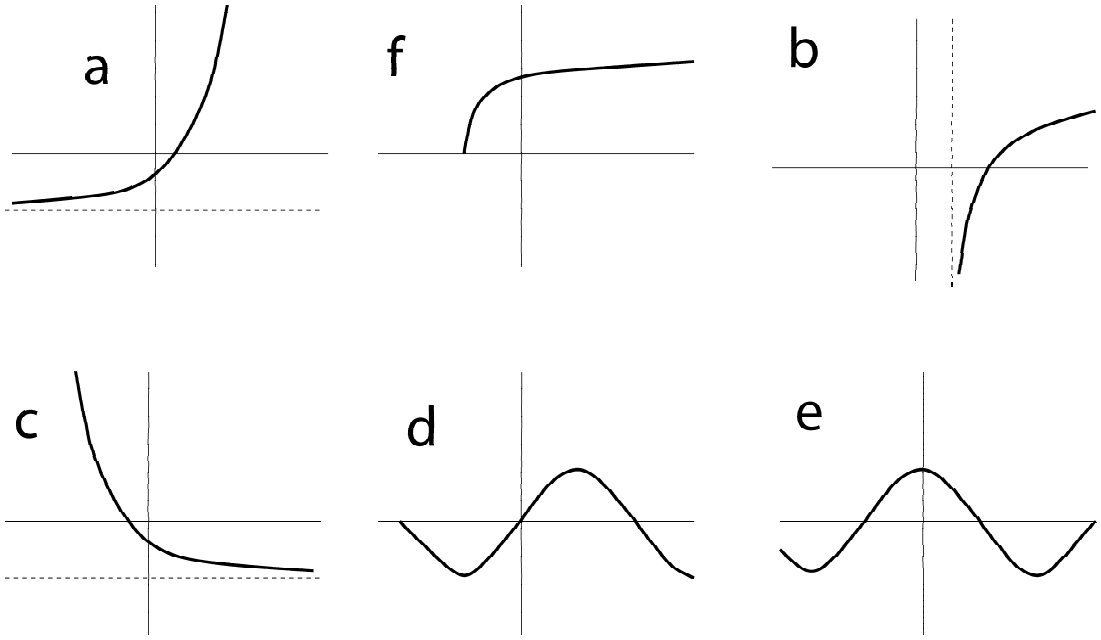
v.) Is f one-to-one? *Yes*

Since the inverse exists, it must be one-to-one.

2.) Match the following functions to their graphs:

a.) $y = e^x - 1$ b.) $y = ln(x-1)$ c.) $y = e^{-x} - 1$

d.) $y = cos(x - \frac{\pi}{2})$ e.) $y = sin(x + \frac{\pi}{2})$ f.) $y = \sqrt{x+1}$



3.) Circle T for true and F for false.

F 6i.) If f is a function, the $f(s+t) = f(s) + f(t)$.

F 6ii.) If f is a one-to-one function, the $f^{-1}(x) = \frac{1}{f(x)}$.

F 6iii.) If $a > 0$ and $b > 0$, $ln(a+b) = ln(a)ln(b)$