Math 115 Quiz #3 No calculators—show all work 3/11/09

① Let $f(x) = \begin{cases} 3x-1, & x<-1 \\ 4, & -1 \le x \le 1 \\ x^2, & x>1 \end{cases}$

Find $f(\frac{7}{2}) = (\frac{7}{2})^2 = \frac{49}{4}$, since $\frac{7}{2} > 1$

② Find the domain of $f(x) = \frac{1}{\sqrt{-8x+3}}$

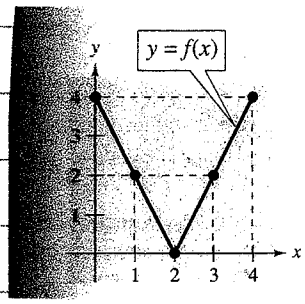
Need $-8x+3 > 0$, since it is under a $\sqrt{}$ and in a denominator.

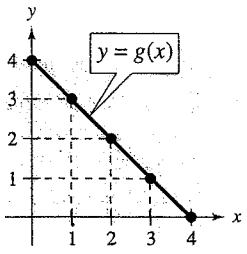
$\Rightarrow -8x > -3$

$x < 3/8$

$\boxed{(-\infty, 3/8)}$

③ Given the graphs, calculate:





$(g-f)(4) = g(4) - f(4) = 0 - 4 = -4$

$(fg)(4) = f(4)\,g(4) = 4 \cdot 0 = 0$

$(g \circ f)(4) = g(f(4)) = g(4) = 0$

$(f \circ g)(4) = f(g(4)) = f(0) = 4$

$(g \circ g)(4) = g(g(4)) = g(0) = 4$

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① Let $f(x) = \begin{cases} 3x-1, & x < -1 \\ 4, & -1 \le x \le 1 \\ x^2, & x > 1 \end{cases}$

Find $f(\frac{1}{2}) = 4$, since $-1 \le \frac{1}{2} \le 1$

② Find the domain of $f(x) = \frac{1}{\sqrt{7x+4}}$

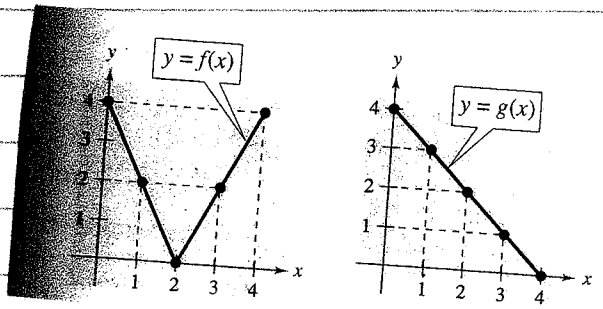
Need $7x+4 > 0$, since $7x+4$ is under a $\sqrt{}$ and in a denominator

$\Rightarrow 7x > -4$

$x > -4/7$

$\boxed{(-4/7, \infty)}$

③ Given the graphs, calculate:



$(f-g)(3) = f(3) - g(3) = 2 - 1 = 1$

$(fg)(1) = f(1) \cdot g(1) = 2 \cdot 3 = 6$

$(f \circ g)(4) = f(g(4)) = f(0) = 4$

$(g \circ f)(3) = g(f(3)) = g(2) = 2$

$(f \circ f)(3) = f(f(3)) = f(2) = 0$