Math 220 Section 6 Quiz 1

2 September 2015

Name: Answer Key

1. For each function F, find two functions f and g such that $F = f \circ g$. Do not use the trivial $f(x) = x$ or $g(x) = x$.

   (a) $F(x) = \frac{3}{x+5}$

   $f(x) = \frac{3}{x}$

   $g(x) = x+5$

   (b) $F(x) = \sqrt{x^2 + x - 2}$

   $f(x) = \sqrt{x}$

   $g(x) = x^2 + x - 2$

2. Given that the point $(2, 9)$ lies on the line $kx + 3y + 4 = 0$, find k.

   $2k + 27 + 4 = 0$

   $k = \frac{-31}{2}$

Math 220 Section 6 Quiz 2

9 September 2015

Name: Answer Key

1. $\lim_{h \to 0} \frac{(x+h)^2 - x^2}{h}$ $= \lim_{h \to 0} \frac{x^2 + 2xh + h^2 - x^2}{h} = \lim_{h \to 0} \frac{2xh + h^2}{h}$

$= \lim_{h \to 0} 2x + h = \boxed{2x}$

2. $\lim_{t \to 9} \frac{t-9}{\sqrt{t}-3}$ $= \lim_{t \to 9} \frac{t-9}{\sqrt{t}-3} \cdot \frac{\sqrt{t}+3}{\sqrt{t}+3} = \lim_{t \to 9} \frac{(t-9)(\sqrt{t}+3)}{t-9} = \lim_{t \to 9} (\sqrt{t}+3) = \boxed{6}$

3. $\lim_{x \to 0^-} \left(\frac{1}{x} + \frac{1}{x^2 - x} \right)$ $= \lim_{x \to 0^-} \left(\frac{x-1}{x(x-1)} + \frac{1}{x(x-1)} \right) = \lim_{x \to 0^-} \frac{x}{x(x-1)} = \lim_{x \to 0^-} \frac{1}{x-1}$

$= \boxed{-1}$