

Warm ups: in NOTES not journal

F-C2

1. Find the values of a and b that would make $g(x)$ continuous if $g(x) = \begin{cases} -2x^2 + 3, & x < 0 \\ ax + b, & 0 \leq x \leq 1 \\ 9x, & x > 1 \end{cases}$

$\lim_{x \rightarrow 0^-} g(x) = 3 \rightarrow b = 3$
 $\lim_{x \rightarrow 1^-} g(x) = a + b$
 $\lim_{x \rightarrow 1^+} g(x) = 9 \rightarrow a + b = 9$
 $f(0) = b$
 $\therefore a = 6$

F-C4: Let $g(x) = x - 1$, $f(x) = x^2 + 4$, and $h(x) = f(g(x))$.

1. Explain why there must be a value c for $-1 < c < 4$ such that $h(c) = 10$

$h(x) = (x - 1)^2 + 4$ $h(x)$ is continuous on $[-1, 4]$.

$h(-1) = (-1 - 1)^2 + 4 = (-2)^2 + 4 = 8$

$h(4) = (3)^2 + 4 = 9 + 4 = 13$

By IVT, there exists c , $-1 < c < 4$ s.t.

$h(c) = 10 \wedge h(-1) < h(c) < h(4)$