

Continuity WS

1. Prove that $f(x) = 2x^2 - x + 1$ is continuous @ $x = 2$.
2. Prove that $g(x) = \frac{x-1}{x}$ is continuous @ $x = 1$
3. Prove that $h(x) = \sin x + \tan x$ is continuous @ $x = 0$.
4. Find the discontinuities for $p(t) = \frac{4t+10}{t^2-2t-15}$ and
prove each discontinuity using the definition of continuity.
5. Find the discontinuities for $\phi(x) = \sin x + \tan x$ and
prove each discontinuity using the definition of continuity.

Review

6. Evaluate $\lim_{x \rightarrow 3} \frac{x^3 - 5x + 4}{x^2 - 2}$

7. Evaluate $\lim_{x \rightarrow 1} \frac{x^2 - 1}{1 - x}$

8. Evaluate $\lim_{x \rightarrow 0} \frac{2x}{3 - \sqrt{x+9}}$

9. If $f(x) = \begin{cases} \frac{\sin 4x}{x}, & x < 0 \\ x^2 + 4, & 0 \leq x < 2 \\ \frac{x^2 - 4}{x^2 - 4x + 4}, & x \geq 2 \end{cases}$

a) $\lim_{x \rightarrow 0^-} f(x)$

b) $\lim_{x \rightarrow 0^+} f(x)$

c) $\lim_{x \rightarrow 0} f(x)$

d) $\lim_{x \rightarrow 2^-} f(x)$

e) $\lim_{x \rightarrow 2^+} f(x)$

f) $\lim_{x \rightarrow 2} f(x)$

g) $f(0) =$

h) $f(2) =$

10. Find a value for p so that the function

$g(x) = \begin{cases} x^2 + x + p, & x < 1 \\ x^3, & x \geq 1 \end{cases}$ is continuous.