Answer on Question #78867 – Math – Calculus

Question

For which value(s) of k, is the function f, defined as below, continuous at x =2?
f(x)={3-kx, 1less than equal x<2
{ x^2/4 - 3, x greater than equal 2

Further, at which other points in [1, infinity[is continuous, and why?

Solution

Function f(x) is continuous at x=2 if:

$$\lim_{x\to 2^-} f(x) = \lim_{x\to 2^+} f(x) \ \to \lim_{x\to 2^-}(3-kx) = \lim_{x\to 2^+}(\frac{x^2}{4}-3) \ \to$$

$$\to \quad 3-2k = \frac{4}{4}-3 \to \quad k = \frac{5}{2}.$$

Functions $3-kx$ and $\frac{x^2}{4}-3$ are continuous on $(-\infty,\infty)$, so $f(x)$ is continuous on $[1,\infty)$.

Answer provided by https://www.AsignmentExpert.com