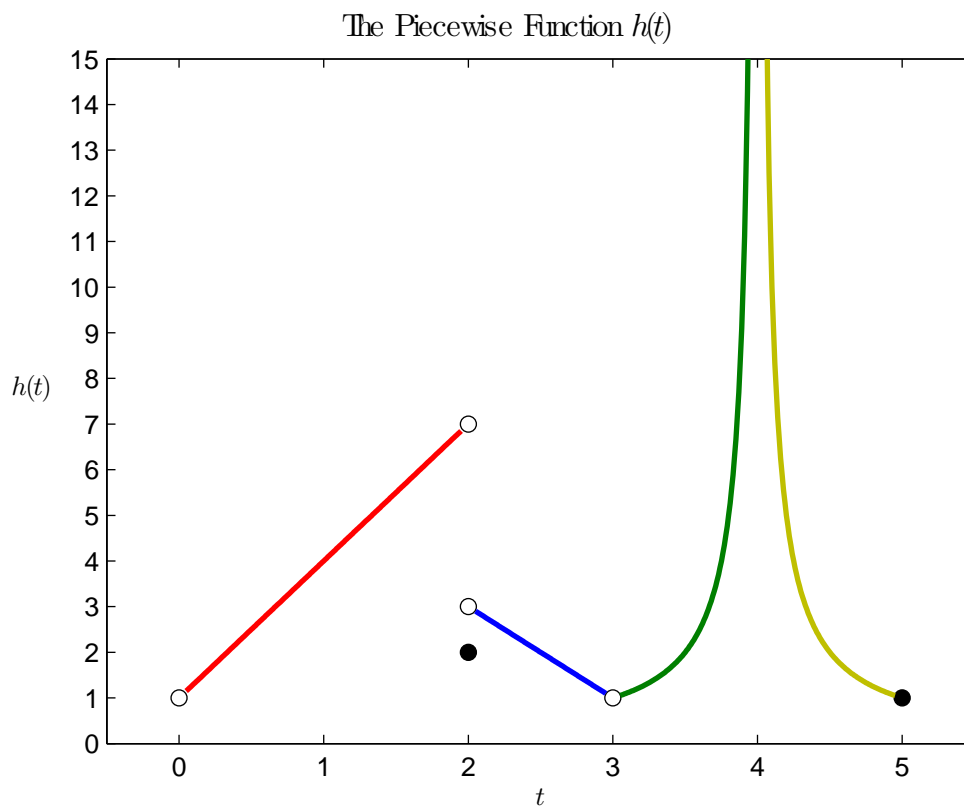


Math 2143 - Brief Calculus with Applications

Homework #3 - 2008.01.31

Due Date - 2008.02.07

Name: _____



1. Place the following functions into the piecewise function definition given below.

$$h_1(t) = 2, \quad h_2(t) = -\frac{1}{t-4}, \quad h_3(t) = 7 - 2t, \quad h_4(t) = 1 + 3t, \quad h_5(t) = \frac{1}{t-4}$$

$$h(t) = \left\{ \begin{array}{l} , \quad 0 < t < 2 \\ , \quad t = 2 \\ , \quad 2 < t < 3 \\ , \quad 3 < t < 4 \\ , \quad 4 < t \leq 5 \end{array} \right.$$

2. Find the values of a for which the following limits do not exist:

a) $\lim_{t \rightarrow a^-} h(t)$

b) $\lim_{t \rightarrow a^+} h(t)$

c) $\lim_{t \rightarrow a} h(t)$

3. Sketch the graph of ONE function $f(x)$ which satisfies ALL 10 of the following conditions.

a) $\lim_{x \rightarrow 0} f(x) = 2$, b) $f(0) = 1$, c) $\lim_{x \rightarrow 1^-} f(x) = -\infty$,

d) $\lim_{x \rightarrow 1^+} f(x) = \infty$, e) $\lim_{x \rightarrow 2^-} f(x) = 1$, f) $\lim_{x \rightarrow 2^+} f(x) = -1$,

g) $f(2) = 4$, h) $\lim_{x \rightarrow 3^-} f(x) = \infty$, i) $\lim_{x \rightarrow -1^+} f(x) = -\infty$,

j) $f(x)$ is continuous at all points on the interval $(-1, 3)$ except at $x = 0$, $x = 1$ and $x = 2$.

4. Which type of discontinuity does $f(x)$ have at $x = 0$, at $x = 1$ and at $x = 2$?