MATH 110
Continuity
Worksheet (2)

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Choose the correct answer:

1. The function $f(x) = \begin{cases} 3x-1 & \text{if } x \leq 1 \\ x^2 & \text{if } x > 1 \end{cases}$ is .... at $x = 1$.	
(a) continuous	(c) right continuous
(b) left continuous	(d) discontinuous

2. The function $f(x) = \begin{cases} x & \text{if } x \neq 0 \\ 1 & \text{if } x = 0 \end{cases}$ is .... at $x = 0$.	
(a) continuous	(c) right continuous
(b) left continuous	(d) discontinuous

3. The function $f(x) = \sqrt{3x-5}$ is continuous on the interval................	
(a) $\left(-\infty, \frac{5}{3}\right]$	(c) $\left[\frac{5}{3}, \infty\right)$
(b) $\left(-\infty, -\frac{5}{3}\right]$	(d) $\left[-\frac{5}{3}, \infty\right)$

4. The function $f(x) = \lfloor x \rfloor$ is continuous on .... where n is an integer.	
(a) every interval $(n, n+1]$	(c) every interval $[n, n+1)$
(b) every interval $(n-1, n]$	(d) every interval $[n-1, n)$

5. If $f(x) = \begin{cases} x^2 - k & \text{if } x \leq 6 \\ x & \text{if } x > 6 \end{cases}$ is a continuous function, then $k =$...........	
(a) 36	(c) 6
(b) 30	(d) 3

6. The continuous extension of the function $f(x) = \dfrac{x^2 - 2x - 3}{x^2 - 9}$ at $x = 3$ is	
(a) $F(x) = \begin{cases} \dfrac{x^2 - 2x - 3}{x^2 - 9} & \text{if } x \neq 3 \\ 3 & \text{if } x = 3 \end{cases}$	(c) $F(x) = \begin{cases} \dfrac{x^2 - 2x - 3}{x^2 - 9} & \text{if } x \neq 3 \\ \dfrac{2}{3} & \text{if } x = 3 \end{cases}$
(b) $F(x) = \begin{cases} \dfrac{x^2 - 2x - 3}{x^2 - 9} & \text{if } x \neq 3 \\ 0 & \text{if } x = 3 \end{cases}$	(d) $F(x) = \begin{cases} \dfrac{x^2 - 2x - 3}{x^2 - 9} & \text{if } x \neq 3 \\ -3 & \text{if } x = 3 \end{cases}$

7. Which of the following functions has a removable discontinuity at $x = 1$?	
(a) $g(x) = \begin{cases} x & \text{if } x \neq 1 \\ -1 & \text{if } x = 1 \end{cases}$	(c) $g(x) = \begin{cases} x & \text{if } x < 1 \\ -1 & \text{if } x > 1 \end{cases}$
(b) $g(x) = \begin{cases} x & \text{if } x < 1 \\ -1 & \text{if } x \geq 1 \end{cases}$	(d) $g(x) = \begin{cases} x & \text{if } x > 1 \\ -1 & \text{if } x \leq 1 \end{cases}$

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