

| Student ID | | |
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Last Name: _____

First Name: _____

Show all your work.
If necessary, use extra sheets.

When appropriate,
BOX your final answer.

MA1
Homework

9

1. Find a value for the constant k , if possible, that will make the function continuous.

$$(a) f(x) = \begin{cases} 7x - 2 & x \leq 1 \\ kx^2 & x > 1 \end{cases}$$

$$(b) f(x) = \begin{cases} kx^2 & x \leq 2 \\ 2x + k & x > 2 \end{cases}$$

2. On which of the following intervals is $f(x) = \frac{1}{\sqrt{x-2}}$ continuous? **Justify your answer.**

- (a) $[2, +\infty)$ (b) $(-\infty, +\infty)$
(c) $(2, +\infty)$ (d) $[1, 2)$

3. Check the following function for continuity at $x = 3$ and at $x = -3$.

$$f(x) = \begin{cases} \frac{x^3 - 27}{x^2 - 9} & x \neq 3 \\ \frac{9}{2} & x = 3 \end{cases}$$

4. Find the points of discontinuity and determine whether the discontinuities are removable.

(a) $f(x) = \frac{x^2 - 4}{x^3 - 8}$

(b) $f(x) = \begin{cases} 2x - 3 & x \leq 2 \\ x^2 & x > 2 \end{cases}$

(c) $f(x) = \begin{cases} 3x^2 + 5 & x \neq 1 \\ 6 & x = 1 \end{cases}$

5. For the function below, find the coordinates of any points of discontinuity and state the equations of any vertical asymptotes or horizontal asymptotes.

$$f(x) = \frac{3x - 2}{\sqrt{2x^2 + 1}}$$