

Calculus I

Review Continuity at a Point

Determine if the following function is continuous. If there is discontinuity determine the type and where it occurs. If it is removable, write a new continuous function.

$$1. f(x) = \frac{4x^2 + 4x - 3}{2x + 3}$$

$$2. f(x) = -x^3 + 4x^2 - 7$$

$$3. f(x) = \frac{5}{x^2 + 3}$$

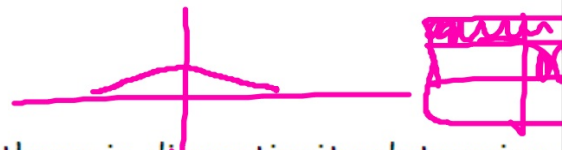
$$4. f(x) = \frac{x+1}{x^2-1}$$

$$5. f(x) = \begin{cases} x^2 & x < 2 \\ 3x - 2 & x \geq 2 \end{cases}$$

$$6. f(x) = \begin{cases} \frac{1}{x} & x \leq 3 \\ \frac{1}{9}x & x > 3 \end{cases}$$

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Continuity at a Point



Determine if the following function is continuous. If there is discontinuity determine where it occurs. If it is removable, write a new continuous function.

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

Discontinuous

$$x = -3/2$$

$$\frac{2x-1}{2x+3} \text{ if } x \neq -3/2$$

$$-4 \text{ if } x = -3/2$$

$$2. f(x) = -x^3 + 4x^2 - 7$$

Continuous

$$3. f(x) = \frac{5}{x^2 + 3}$$

$$x^2 + 3 = 0$$

$$x^2 = -3$$

$$x = \pm i\sqrt{3}$$

continuous

$$\frac{x+1}{x^2-1} = \frac{1}{x-1}$$

$\rightarrow (x \neq 1)$

continuous

$$= 1$$

$$+ x = 1$$

$$5. f(x) = \begin{cases} x^2 & x < 2 \\ 3x - 2 & x \geq 2 \end{cases}$$

continuous

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

$$4 = 4$$

$$6. f(x) =$$

Discontinuous

Asymptote at $x = 0$

