

WS 1_Piece-Wise Limits

For questions 1 and 2, find the value of a so that the limit exists:

1.) as x approaches 2 for $f(x) = \begin{cases} a - x^2, & x < 2 \\ x^2 + 5x - 3, & x \geq 2 \end{cases}$

2.) as x approaches -1 for $f(x) = \begin{cases} x^3 - 4x, & x < -1 \\ 2x + a, & x \geq -1 \end{cases}$

3.) Use the Sandwich Theorem to show that

$$\lim_{x \rightarrow 0} \frac{x \sin x}{2 - 2 \cos x} = 1 \quad \text{if} \quad 1 - \frac{x^2}{6} < \frac{x \sin x}{2 - 2 \cos x} < 1$$