

Math 131 - Quiz 2

This quiz is available in Canvas.

1. (1 point) Determine $\lim_{x \rightarrow 2} f(x)$ if $\lim_{x \rightarrow 2} \left(\frac{x^2 + 3x - f(x)}{x + 3} \right) = 4$.

- (a) 4
- (b) 10
- (c) -10
- (d) None of the above

$$\frac{4 + 6 - \lim_{x \rightarrow 2} f(x)}{2 + 3} = 4 \Rightarrow 10 - \lim_{x \rightarrow 2} f(x) = 20$$

MUST BE -10

2. (1 point) Evaluate the limit: $\lim_{r \rightarrow \pi} \frac{\sin r}{r}$

- (a) 0
- (b) 1
- (c) π
- (d) None of the above

$$\frac{\sin \pi}{\pi} = \frac{0}{\pi} = 0$$

3. (1 point) Evaluate the limit: $\lim_{z \rightarrow -5} (2z^2 - 8z + 7)$

- (a) 147
- (b) 97
- (c) -3
- (d) None of the above

$$2(-5)^2 - 8(-5) + 7 = 50 + 40 + 7 = 97$$

4. (1 point) Explain why this limit fails to exist: $\lim_{x \rightarrow 0} \sqrt{x}$

- (a) The limit from the left does not equal the limit from the right.
- (b) The function values grow without bound as the limit point is approached.
- (c) The function values oscillate as the limit point is approached.
- (d) The function is not defined on an open interval containing the limit point.

$$\lim_{x \rightarrow 0^+} \sqrt{x} = 0 \quad \text{But} \quad \lim_{x \rightarrow 0^-} \sqrt{x} \text{ DNE}$$

o/o MORE WORK

5. (2 points) Evaluate the limit: $\lim_{x \rightarrow 1} \frac{x^2 - x}{x - \sqrt{x}} \cdot \frac{x + \sqrt{x}}{x + \sqrt{x}}$

(a) 0

(b) 0/0

(c) 2

(d) The limit does not exist.

$$\lim_{x \rightarrow 1} \frac{\cancel{(x^2 - x)}(x + \sqrt{x})}{\cancel{x^2 - x}} = 2$$

o/o MORE WORK

6. (2 points) Evaluate the limit: $\lim_{y \rightarrow -3} \frac{y(y - 2) - 15}{y + 3}$

(a) 0/0

(b) -8

(c) 5

(d) 0

$$\lim_{y \rightarrow -3} \frac{y^2 - 2y - 15}{y + 3} = \lim_{y \rightarrow -3} \frac{(y + 3)(y - 5)}{y + 3} = -8$$

7. (2 points) Evaluate the limit: $\lim_{x \rightarrow 9} \frac{x^2 - 81}{x + 9} = \frac{81 - 81}{18} = \frac{0}{18} = 0$

(a) 0

(b) 0/0

(c) 18

(d) The limit does not exist.