

Name: _____

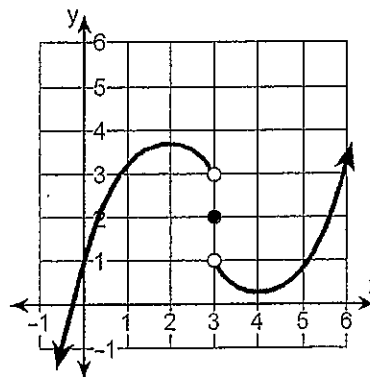
- 1) The $\lim_{x \rightarrow 3} \frac{x^2 - 2x - 3}{x^2 - 6x + 9}$ is
 A) $+\infty$ B) 0
 C) nonexistent D) $-\infty$
 E) $\frac{2}{3}$
- 2) The $\lim_{x \rightarrow -1} \frac{x^2 + 6x + 5}{x^2 - 3x - 4}$ is
 A) $-\frac{4}{5}$ B) $\frac{4}{5}$ C) 1
 D) $-\frac{5}{4}$ E) -2
- 3) The $\lim_{x \rightarrow 3} \frac{x^3 - 27}{9 - x^2}$ is
 A) 0 B) $\frac{9}{2}$
 C) $-\frac{9}{2}$ D) nonexistent
 E) 3
- 4) $\lim_{h \rightarrow 0} \frac{(1+h)^3 - 1}{h}$ is
 A) 0 B) nonexistent
 C) 1 D) -1
 E) 3
- 5) $\lim_{x \rightarrow -2} \frac{|x+2|}{x+2}$ is
 A) -1 B) 0
 C) nonexistent D) 1
 E) none of these
- 6) $\lim_{x \rightarrow 2} \frac{1 - \frac{4}{x} + \frac{4}{x^2}}{1 + \frac{1}{x} - \frac{6}{x^2}}$ is
 A) 0 B) $\frac{1}{3}$ C) -1
 D) 3 E) 1
- 7) $\lim_{x \rightarrow 7} \frac{x-7}{\sqrt{x}-\sqrt{7}}$ is
 A) nonexistent B) $2\sqrt{7}$
 C) 0 D) $-2\sqrt{7}$
 E) $\sqrt{7}$

- 8) Given function
- f
- defined below.

$$f(x) = \begin{cases} x^2 + 2x, & x \leq a \\ x+2, & x > a \end{cases}$$

Determine all values of a for which $\lim_{x \rightarrow a} f(x)$ exists.

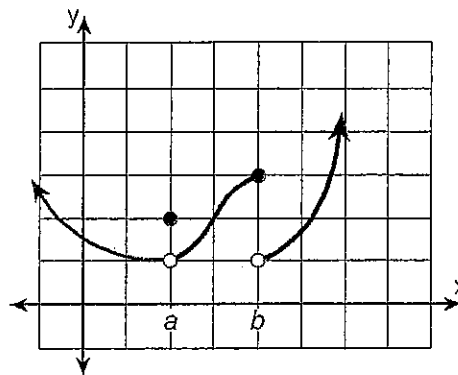
- A) No value of a exists.
 B) $a = -2$ and $a = 1$
 C) $a = 2$ and $a = -1$
 D) $a = 1$
 E) $a = -2$
- 9) $\lim_{x \rightarrow \infty} \frac{4x^2 + 16}{x^3 - 64}$ is
 A) $-\frac{1}{4}$ B) 0
 C) 4 D) ∞
 E) none of these
- 10) $\lim_{x \rightarrow -\infty} \frac{x^4 - 81}{3x^2 - 27}$ is
 A) $-\infty$ B) 0
 C) $\frac{1}{3}$ D) $+\infty$
 E) none of these
- 11) The graph of function g is shown below.

Which of the following is *not* true?

- A) $\lim_{x \rightarrow 3^-} f(x) = 3$ B) $\lim_{x \rightarrow 1} f(x) = f(1)$
 C) $f(3) = 2$ D) $\lim_{x \rightarrow 3} f(x)$ exists
 E) $\lim_{x \rightarrow 3^+} f(x) = 1$

- 12) $\lim_{x \rightarrow \infty} \frac{3 - 5x^2 - 2x^3}{6x^3 + x^2 - 2x + 1}$ is
- A) $-\frac{1}{3}$ B) $\frac{1}{3}$
 C) -2 D) nonexistent
 E) $\frac{1}{2}$
- 13) $\lim_{x \rightarrow \infty} \frac{(4-x)(4+x)}{(x+2)^2} =$
- A) $+1$ B) 0 C) -1
 D) $-\infty$ E) $+\infty$
- 14) If $g(x) = 2\pi^3$, then $g'(x) =$
- A) $6x$ B) $6\pi^2x$ C) $6\pi^2$
 D) 0 E) 6π

- 15) The graph of function f is shown below.



Which of the following statements about function f are true?

- I. $\lim_{x \rightarrow b} f(x)$ exists
 II. $\lim_{x \rightarrow a} f(x)$ exists
 III. $\lim_{x \rightarrow a} f(x) \neq f(a)$
- A) III, only B) I, II, and III
 C) II, only D) I and II, only
 E) II and III, only

(16) Given: $f(x) = \frac{x}{x-1}$

Find an equation of the tangent line at $x=2$.