

Name: _____

Period: _____

Date: _____

AP Calc BC

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5.6 & 8.8 AP MC Practice

BC 2016 Practice Exam: No Calculator

$$f(x) = \begin{cases} \frac{|x|}{x} & \text{for } x \neq 0 \\ 0 & \text{for } x = 0 \end{cases}$$

9. The function f is defined above. The value of $\int_{-5}^3 f(x) dx$ is
(A) -2 (B) 2 (C) 8 (D) nonexistent
19. $\lim_{x \rightarrow e} \frac{(x^{20} - 3x) - (e^{20} - 3e)}{x - e}$ is
(A) 0 (B) $20e^{19} - 3$ (C) $e^{20} - 3e$ (D) nonexistent
21. Which of the following statements about the integral $\int_0^{\pi} \sec^2 x dx$ is true?
(A) The integral is equal to 0 .
(B) The integral is equal to $\frac{2}{3}$.
(C) The integral diverges because $\lim_{x \rightarrow \frac{\pi}{2}^-} \sec^2 x$ does not exist.
(D) The integral diverges because $\lim_{x \rightarrow \frac{\pi}{2}^-} \tan x$ does not exist.

24. $\lim_{x \rightarrow 3} \frac{\tan(x-3)}{3e^{x-3} - x}$ is
- (A) 0 (B) $\frac{1}{3}$ (C) $\frac{1}{2}$ (D) nonexistent

BC 2016: No Calculator

1. $\lim_{x \rightarrow 1} \frac{x^2 - 1}{\sin(\pi x)}$ is
- (A) -2 (B) $-\frac{2}{\pi}$ (C) 0 (D) $\frac{2}{\pi}$ (E) nonexistent
25. $\lim_{h \rightarrow 0} \frac{e^{-1-h} - e^{-1}}{h}$ is
- (A) -1 (B) $-\frac{1}{e}$ (C) 0 (D) $\frac{1}{e}$ (E) nonexistent

BC 2015: No Calculator

12. $\lim_{x \rightarrow 0} \frac{e^x - 1}{x}$ is
- (A) ∞ (B) $e - 1$ (C) 1 (D) 0 (E) e^x
21. $\int_1^{\infty} \frac{1}{x^p} dx$ and $\int_0^1 \frac{1}{x^p} dx$ both diverge when $p =$
- (A) 2 (B) 1 (C) $\frac{1}{2}$ (D) 0 (E) -1

BC 2014: No Calculator

3. $\lim_{x \rightarrow 0} \frac{x^2}{1 - \cos x}$ is
- (A) -2 (B) 0 (C) 1 (D) 2 (E) nonexistent

18. $\int_1^{\infty} \frac{x^2}{(x^3 + 2)^2} dx$ is
- (A) $-\frac{1}{9}$ (B) $\frac{1}{9}$ (C) $\frac{1}{3}$ (D) 1 (E) divergent

BC 2013: No Calculator

12. For which of the following does $\lim_{x \rightarrow \infty} f(x) = 0$?

I. $f(x) = \frac{\ln x}{x^{99}}$

II. $f(x) = \frac{e^x}{\ln x}$

III. $f(x) = \frac{x^{99}}{e^x}$

- (A) I only
(B) II only
(C) III only
(D) I and II only
(E) I and III only
14. If a and b are positive constants, then $\lim_{x \rightarrow \infty} \frac{\ln(bx + 1)}{\ln(ax^2 + 3)} =$
- (A) 0 (B) $\frac{1}{2}$ (C) $\frac{1}{2}ab$ (D) 2 (E) ∞

17. If $\lim_{h \rightarrow 0} \frac{\arcsin(a + h) - \arcsin(a)}{h} = 2$, which of the following could be the value of a ?

- (A) $\frac{\sqrt{2}}{2}$ (B) $\frac{\sqrt{3}}{2}$ (C) $\sqrt{3}$ (D) $\frac{1}{2}$ (E) 2

27. If $\int_1^x f(t) dt = \frac{20x}{\sqrt{4x^2 + 21}} - 4$, then $\int_1^\infty f(t) dt$ is

- (A) 6 (B) 1 (C) -3 (D) -4 (E) divergent

Answers

BC 2016 Practice Exam

9. A
19. B
21. D
24. C

BC2016

1. B
25. B

BC2015

12. C
21. B

BC2014

3. D
18. B

BC2013

12. E
14. B
17. B
27. A