AP Calculus AB Practice Test | iLearnMath.net

NAME_____

SCORE SHEET [20 PROBLEMS]

1		5		9		13		17	
2		6		10		14		18	
3		7		11		15		19	
4		8		12		16		20	

Questions taken from 256 Problem Collection at ilearnmath.net

Problem 1

If $f'(x) > 0$ and $f''(x) > 0$ for all x, which statement is true about g, the inverse of f?

SHOW ANSWER

   A. g is not a function
   B. g is increasing and concave up everywhere
   C. g is decreasing and concave down everywhere
   D. g is increasing and concave down everywhere
   E. g is decreasing and concave up everywhere

Problem 2

The region R in the first quadrant, enclosed by the lines $x = 0$, and $y = 5$, and the graph of $y = x^2 + 1$. The volume of the solid generated when R is revolved about the y-axis is:

   A. 6π
   B. 8π
   C. $\dfrac{32\pi}{3}$
   D. 16π
   E. $\dfrac{544\pi}{15}$

Problem 3

Let $f(x) = \begin{cases} \sin x, x < 0 \\ x^2, 0 \le x < 1 \\ 2 - x, 1 \le x < 2 \\ x - 3, x \ge 2 \end{cases}$

SHOW ANSWER

For what values of x is f discontinuous?

A.   0 only
B.   1 only
C.   2 only
D.   0 and 2 only
E.   0, 1, and 2

Problem 4

What is $\lim\limits_{x \to \infty} \dfrac{x^2 - 4}{2 + x - 4x^2}$?

SHOW ANSWER

A. -2
B. -0.25
C. 0.5
D. 1
E.   DNE

Problem 5

If r is positive and increasing, for what value of r is the rate of increase of r^3 twelve times that of r?

SHOW ANSWER

A. $\sqrt[3]{4}$

B. 2

C. 6

D. $2\sqrt{3}$

E. $\sqrt[3]{12}$

Problem 6

The area of the region in the first quadrant between the graph of $y = x\sqrt{4 - x^2}$ and the x-axis is:

A. $\dfrac{2}{3}\sqrt{2}$

B. $\dfrac{8}{3}$

C. $2\sqrt{2}$

D. $2\sqrt{3}$

E. $\dfrac{16}{3}$

Problem 7

$$\lim_{t \to 0} \frac{\sin(2t)}{8t} =$$

SHOW ANSWER

A. 0

B. $\dfrac{1}{8}$

C. $\dfrac{1}{4}$

D. 4

E. 8

Problem 8

$$\int_{0}^{4} \sqrt{16 - x^2}\,dx =$$

SHOW ANSWER

A. $\dfrac{\pi}{2}$

B. π

C. 2π

D. 4π

E. 16π

Problem 9

Evaluate $\int_1^2 (12 + \frac{8}{x^3})dx$

SHOW ANSWER

A. 7

B. $\frac{43}{3}$

C. 15

D. 23

E. None of the above.

Problem 10

Find the area enclosed by $y = x - 2$ and $y = -x^2 + 4x - 2$.

SHOW ANSWER

A. $\frac{3}{5}$

B. $\frac{3}{2}$

C. $\frac{8}{3}$

D. $\frac{11}{3}$

E. $\frac{9}{2}$

Problem 11

$$\lim_{x \to 0} \frac{x^3 + x^2 - 2x}{x^3 - x} =$$

SHOW ANSWER

A. -1
B. 0
C. 1
D. 2
E. ∞

Problem 12

The region enclosed by the line $x + y = 1$ and the coordinate axes is rotated about the line $y = -1$. The volume of the solid is: SH

A. $\dfrac{17\pi}{2}$

B. $\dfrac{12\pi}{4}$

C. $\dfrac{2\pi}{3}$

D. $\dfrac{3\pi}{4}$

E. $\dfrac{4\pi}{3}$

Problem 13

$y = \sin x + \cos x$ is a solution of:

I. $y + \dfrac{dy}{dx} = 2 \sin x$

II. $y + \dfrac{dy}{dx} = 2 \cos x$

III. $\dfrac{dy}{dx} - y = -2 \sin x$

A.   I only
B.   II only
C.   III only
D.   I and III
E.   II and III

Problem 14

$f(x) = n + e^{2x} \ldots x \geq 0$
$f(x) = 4 + mx \ldots x < 0$
is differentiable at $x = 0$. $f(n - m) = ?$

A. $2 + e$
B. $3 + e^2$
C. e^2
D. $2e$
E. e^3

Problem 15

If $\dfrac{dy}{dx} = \sin x^3$, $\dfrac{d^2y}{dx^2} =$

SHOW ANSWER

A. $3x^2 \cos x^3$
B. $-3x^2 \cos(x^3)$
C. $x^2 \cos(3^2)$
D. $-x^2 \cos(3^2)$
E. $\cos(x^3)$

Problem 16

Which is an antiderivative of 3^x?

SHOW ANSWER

A. $\dfrac{3^x}{\ln 3} + \ln 3$

B. $\dfrac{3^{3x}}{\ln 3} + \ln 3$

C. $\dfrac{x^3}{\ln 3} + \dfrac{1}{\ln 3}$

D. $x + 3 \ln 3$

E. $3^x + \ln 3$

Problem 17

If $f(x) = e^x$, then $\ln[f'(2)] =$

SHOW ANSWER

A. 2
B. 0
C. $\dfrac{1}{e^2}$
D. $2e$
E. e^2

Problem 18

If $y^2 - 2xy = 16$, then $\dfrac{dy}{dx} =$

SHOW ANSWER

A. $\dfrac{x}{y - x}$
B. $\dfrac{y}{x - y}$
C. $\dfrac{y}{y - x}$
D. $\dfrac{y}{2y - x}$
E. $\dfrac{2y}{x - y}$

Problem 19

A person 2 meters tall walks directly away from a streetlight that is 8 meters above the ground. If the person is walking at a constant rate and the the person's shadow is lengthening at a rate of $\frac{4}{9}$ meter per second, at what rate, in meters per second, is the person walking?

SHOW ANSWER

A. $\dfrac{4}{27}$

B. $\dfrac{4}{9}$

C. $\dfrac{3}{4}$

D. $\dfrac{4}{3}$

E. $\dfrac{16}{9}$

Problem 20

Let f and g be differentiable functions. If g is the inverse function of f and if $g(-2) = 5$ and $f'(5) = -\dfrac{1}{2}$, then $g'(-2) =$

A. 2

B. $\dfrac{1}{2}$

C. $\dfrac{1}{5}$

D. $-\dfrac{1}{5}$

E. -2

ANSWER KEY

1 (13)	D	5 (56)	B	9 (171)	C	13 (93)	E	17 (22)	A
2 (21)	B	6 (58)	B	10 (178)	E	14 (94)	B	18 (23)	C
3 (34)	C	7 (167)	C	11 (253)	D	15 (95)	A	19 (27)	D
4 (55)	B	8 (168)	D	12 (92)	E	16 (98)	A	20 (29)	E