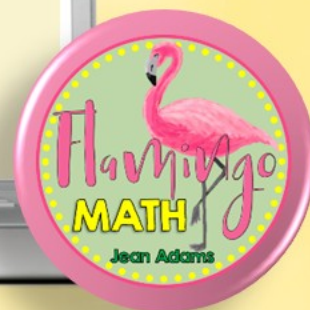
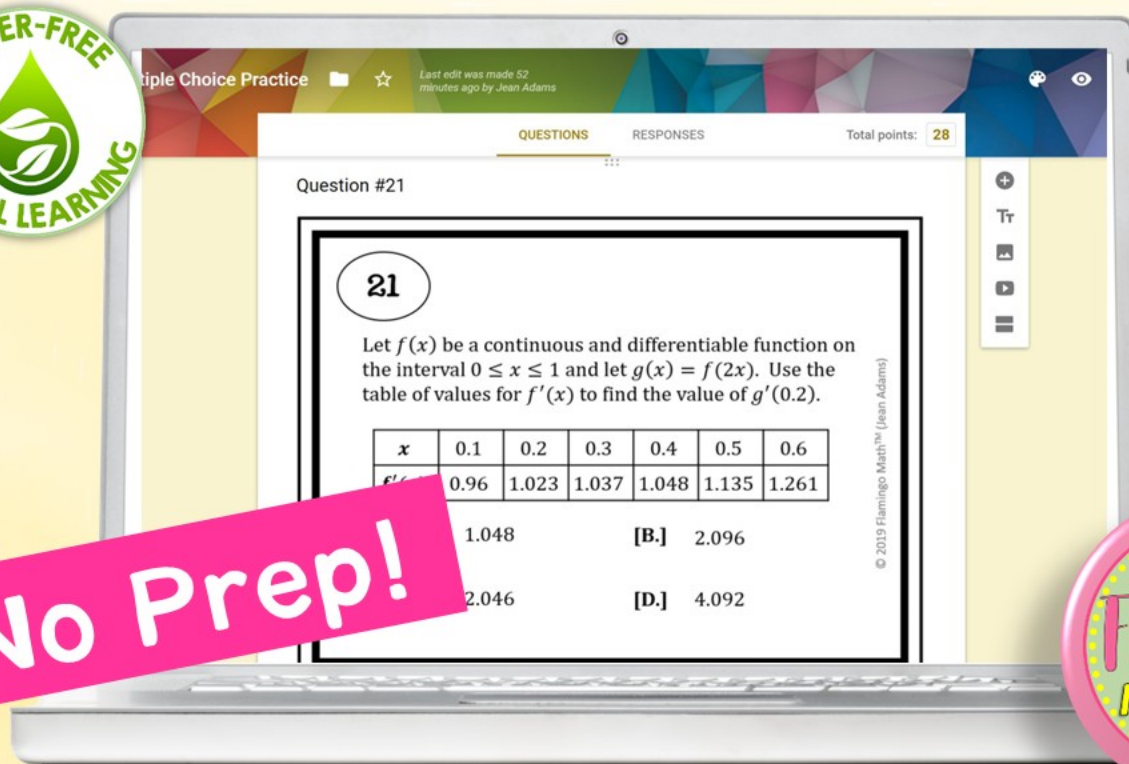
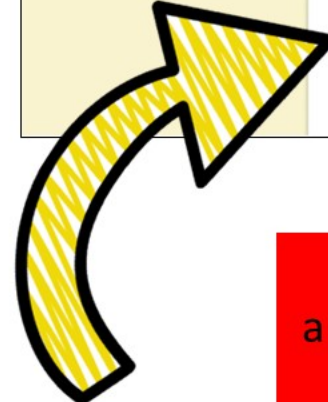
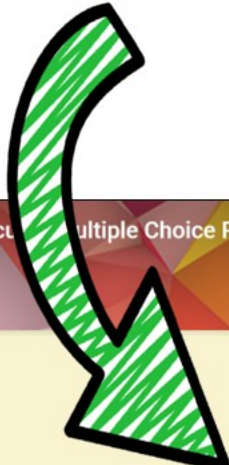


AP[®] Calculus Multiple Choice AP Exam Practice



Digital and Printable

30 Multiple Choice Task Cards



Calculus Multiple Choice Practice

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QUESTIONS RESPONSES Total points: 28

Question #2

2

The area of the region between the graph of $y = 3x^2 - 2x$ and the x-axis from $x = 1$ to $x = 3$ is

[A.] 36 [B.] 18

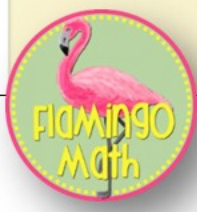
[C.] 20 [D.] 16

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Question #2 *

☐ A

☐ B



Your students can record answers on the Google Form for easy grading.

NOTE: The AP Calculus Exam Section 1 contains 30 no calculator multiple choice questions in a 60 minute timed session.

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1

$$\lim_{x \rightarrow 2} \frac{4 - x^2}{x - 2}$$

- [A.] 0 [B.] 4
[C.] -4 [D.] nonexistent

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2

The area of the region between the graph of $y = 3x^2 - 2x$ and the x-axis from $x = 1$ to $x = 3$ is

- [A.] 36 [B.] 18
[C.] 20 [D.] 16

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3

Suppose that f is a continuous function defined for all real numbers x , $f(-4) = -3$ and $f(-1) = 2$. If $f(x) = 0$ for one and only one value of x , then which of the following could be x ?

- [A.] -6 [B.] -2
[C.] 0 [D.] 1

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4

At what value(s) of x does $f(x) = x^4 - 6x^2$ have a relative minimum?

- [A.] $-\sqrt{3}$ and $\sqrt{3}$ only
[B.] 0 and $\sqrt{3}$ only
[C.] 0 and $-\sqrt{3}$ only
[D.] $-\sqrt{3}$, 0, and $\sqrt{3}$

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5

What is $\lim_{h \rightarrow 0} \frac{\sin\left(\frac{\pi}{3} + h\right) - \sin\left(\frac{\pi}{3}\right)}{h}$

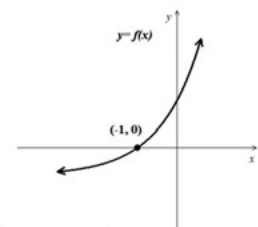
- [A.] 0 [B.] $\frac{\sqrt{3}}{2}$
[C.] $-\frac{1}{2}$ [D.] $\frac{1}{2}$

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6

The graph of f is twice-differentiable. Which of the following has the smallest value?

- I. $f(-1)$
II. $f'(-1)$
III. $f''(-1)$



- [A.] I only [B.] II only
[C.] III only [D.] I and II

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7

$$\int \sqrt{x} (x + 3) dx$$

- [A.] $\frac{3}{2}\sqrt{x} + 2\sqrt{x} + C$
[B.] $\frac{2}{5}x^{5/2} + 2x^{1/2} + C$
[C.] $\frac{2}{5}x^{5/2} + 2x^{3/2} + C$
[D.] $\sqrt{x^3} + 3\sqrt{x} + C$

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8

If $y = 3$ is a horizontal asymptote of a rational function f , then which of the following must be true?

- [A.] $\lim_{x \rightarrow 0} f(x) = 3$
[B.] $\lim_{x \rightarrow -\infty} f(x) = -3$
[C.] $\lim_{x \rightarrow 3} f(x) = \infty$
[D.] $\lim_{x \rightarrow \infty} f(x) = 3$

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9

The slope field for the differential equation

$$\frac{dy}{dx} = \frac{2y}{xy - 4x}$$

will have vertical segments when

- [A.] $x = 0$ and $y = 4$ [B.] $y = 4$ only
[C.] $y = -4$ only [D.] $x = 0$ only

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10

If the radius of a sphere is increasing at the rate of 3 in. per second, how fast, in cubic inches per second, is the volume increasing when the radius is 5 inches?

- [A.] 60π [B.] 300
[C.] 300π [D.] 1200π

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11

Find the derivative for $y = 3 \sin^2(4x)$

- [A.] $24 \sin(4x)$
[B.] $24 \sin(4x) \cos(4x)$
[C.] $12 \sin(4x) \cos(4x)$
[D.] $-24 \sin(4x) \cos(4x)$

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12

Let f be the function given by $f(x) = x^3 + 1$. What are the values of c that satisfy the conclusion of the Mean Value Theorem on the closed interval $[-2, 4]$?

- [A.] -2 and 2 [B.] 1
[C.] 0 [D.] 2

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13

If $5x^2 - xy - 4y^2 = 0$, then $\frac{dy}{dx}$ is

- [A.] $y - 10x$ [B.] $\frac{10x - y}{x + 8y}$
[C.] $\frac{x + 8y}{10x - y}$ [D.] $\frac{x + 8y}{y - 10x}$

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14

Let f and g be continuous and differentiable for all real numbers, which of the following definite integrals is equal to $f(g(5)) - f(g(1))$?

- [A.] $\int_1^5 f'(g(x)) dx$ [B.] $\int_1^5 f(g(x)) f'(x) dx$
[C.] $\int_1^5 f(g(x)) g'(x) dx$ [D.] $\int_1^5 f'(g(x)) g'(x) dx$

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15

$$\int_0^1 \frac{x}{9 + x^2} dx$$

- [A.] $\tan^{-1}\left(\frac{1}{3}\right)$ [B.] $\frac{1}{2} \ln\left(\frac{10}{9}\right)$
[C.] $3 \tan^{-1}\left(\frac{1}{3}\right)$ [D.] $\frac{1}{2} \ln\left(\frac{9}{10}\right)$

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16

What are all values of x for which the graph of $y = \frac{3}{6 - x}$ is concave upward?

- [A.] $x < 6$ [B.] $x > -6$
[C.] $x < -6$ [D.] $x > 6$

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17

$$\frac{d}{dx} \int_x^0 \frac{dt}{1 + t^2} =$$

- [A.] $\arctan x$ [B.] $x^2 + 1$
[C.] $\frac{-1}{x^2 + 1}$ [D.] $\frac{1}{1 - x^2}$

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18

If $0 < k < \pi$ then $\int_0^k \cos(3x) dx = \frac{1}{3}$ when $k =$

- [A.] $\frac{\pi}{12}$ [B.] $\frac{\pi}{6}$
[C.] $\frac{\pi}{4}$ [D.] $\frac{\pi}{2}$

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19

If the region enclosed by the y -axis, the line $y = 2$, and the curve $y = \sqrt[3]{x}$ is revolved about the y -axis, the volume of the solid generated is

- [A.] 4π [B.] 8π
[C.] $\frac{64\pi}{7}$ [D.] $\frac{128\pi}{7}$

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20

If $\frac{dy}{dx} = y \cos x$ and $y = 5$ when $x = 0$ then

- [A.] $y = 5e^{\sin x}$ [B.] $y = e^{\sin x} + 5$
[C.] $y = \sin x + 5$ [D.] $y = e^{\sin x + 5}$

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21

Let $f(x)$ be a continuous and differentiable function on the interval $0 \leq x \leq 1$ and let $g(x) = f(2x)$. Use the table of values for $f'(x)$ to find the value of $g'(0.2)$.

x	0.1	0.2	0.3	0.4	0.5	0.6
$f'(x)$	0.96	1.023	1.037	1.048	1.135	1.261

- [A.] 1.048 [B.] 2.096
[C.] 2.046 [D.] 4.092

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22

The velocity of a particle at time t is given by the function $v(t) = t^3 - \sin t + 5$. What is the acceleration of the particle at time $t = 2\pi$

- [A.] $12\pi^2 - 1$ [B.] $6\pi^2 - 1$
[C.] $12\pi^2 + 1$ [D.] $12\pi^2$

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23

If the substitution $u = \sqrt{x+1}$ is made, the integral $\int_3^8 \frac{\sqrt{x+1}}{x} dx$

- [A.] $\int_3^8 \frac{u}{u^2 - 1} du$ [B.] $\int_2^3 \frac{u^2}{2(u^2 - 1)} du$
[C.] $\int_2^3 \frac{u^2}{u^2 - 1} du$ [D.] $\int_2^3 \frac{2u^2}{u^2 - 1} du$

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24

$$\lim_{n \rightarrow \infty} \frac{3}{n} \sum_{k=1}^n \sqrt{\left(1 + \frac{3k}{n}\right)^2 + 1}$$

- [A.] $\int_0^3 \sqrt{x^2 + 1} dx$ [B.] $\int_1^4 \sqrt{x^2} dx$
[C.] $\int_1^4 \sqrt{x^2 + 1} dx$ [D.] $\int_1^2 \sqrt{x^2} dx$

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25

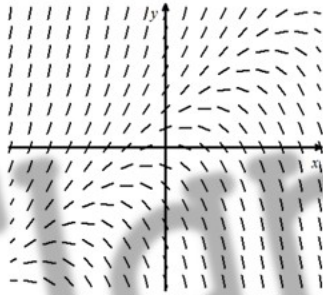
Shown below right is the slope field for which differential equation?

[A.] $\frac{dy}{dx} = y - x$

[B.] $\frac{dy}{dx} = 2 - y$

[C.] $\frac{dy}{dx} = 2 - x$

[D.] $\frac{dy}{dx} = -\frac{x}{y}$



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26

If the graph of $y = x^3 + ax^2 + bx - 5$ has a point of inflection at $(3, 0)$, what is the sum of $(a + b)$?

[A.] -36

[B.] 18

[C.] 36

[D.] 90

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27

If $f(x) = 12 - g(x)$ for $-3 \leq x \leq 3$

then $\int_{-3}^3 [f(x) - g(x)] dx =$

[A.] 72

[B.] $2 \int_{-3}^3 g(x) dx - 72$

[C.] $72 - 4 \int_0^3 g(x) dx$

[D.] $72 - 2 \int_{-3}^3 g(x) dx$

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28

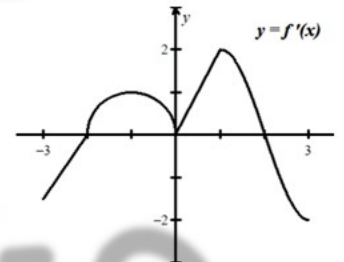
The graph of $f'(x)$ is shown for $-3 \leq x \leq 3$. On which interval(s) is the function $f(x)$ both increasing and concave up?

[A.] $(-2, 0)$

[B.] $(-2, 0) \cup (0, 2)$

[C.] $(-2, -1) \cup (0, 1)$

[D.] $(-3, -2)$



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29

Let $f(x)$ be a continuous and differentiable function. If $g(x) = \frac{1}{f(x)}$, use the table below to find the value of $g'(3)$.

x	1	2	3	4
$f(x)$	-2	0	6	9
$f'(x)$	3	5	-4	-7

[A.] $\frac{1}{6}$

[B.] $\frac{1}{9}$

[C.] $-\frac{1}{18}$

[D.] 18

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30

The graph of $y = h(x)$ consists of a quarter circle and three line segments on $-4 \leq x \leq 5$.

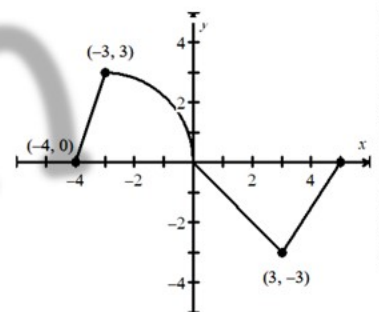
What is $\int_{-4}^5 h(x) dx$?

[A.] $\frac{9\pi}{4} - 6$

[B.] $\frac{9\pi}{2} - 6$

[C.] $\frac{9\pi}{4} + 9$

[D.] $\frac{9\pi}{2} + 6$



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