

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Pd: \_\_\_\_ 2017  
AP Calculus AB - Practice Spot Check/Quiz - 1.2 Finding Limits Graphically and Numerically

1. Question

2. Question

(A)

(B)

(C)

(D)

3. Question

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AP Calculus AB - Practice Spot Check/Quiz - 1.3 Evaluating Limits Analytically

1.  $\lim_{x \rightarrow 1} \frac{x^2 + x + 2}{x + 1}$

2. Let  $\lim_{x \rightarrow 8} f(x) = -5$  and  $\lim_{x \rightarrow 8} g(x) = 10$ . Find the  $\lim_{x \rightarrow 8} \left[ \frac{f(x)}{g(x)} \right]$

(A)  $\frac{1}{2}$

(B) -2

(C)  $-\frac{1}{2}$

(D) 2

3. Find the  $\lim_{x \rightarrow 2} [f(x) + 4g(x)]$  if the  $\lim_{x \rightarrow 2} f(x) = 4$  and the  $\lim_{x \rightarrow 2} g(x) = \frac{1}{2}$  and describe what happens to the graph as  $x$  approaches 2?

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AP Calculus AB - Practice Spot Check/Quiz - 1.4 Continuity and One-Sided Limits

1. Question

$$\lim_{x \rightarrow 2^+} \frac{x^2 + 2x + -8}{x^2 - 4} =$$

2. Question Use the graph of  $y = f(x)$  to evaluate the indicated limit or function value or state that it does not exist.

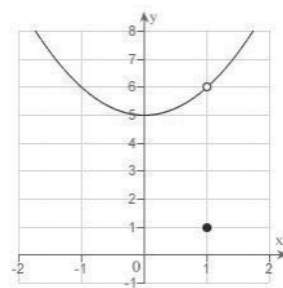
$$\lim_{x \rightarrow 1^-} f(x)$$

(A) 6

(B) 1

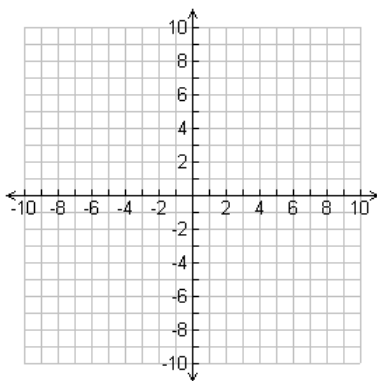
(C) -6

(D) -1



3. Question

Sketch the graph of a function  $f$  that satisfies the following conditions:  $\lim_{x \rightarrow 0^-} f(x) = 1$ ,  $\lim_{x \rightarrow 0^+} f(x) = 0$ ,  $f(0) = 1$ .



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AP Calculus AB - Practice Spot Check/Quiz - 1.5 Infinite Limits

1. For  $f(x) = \frac{3}{x-2}$ , find the limit as  $x$  approaches 2 from the left and the right

2. Find the limit as  $\lim_{x \rightarrow \infty} \frac{x^3 - 11x^2 + 18x}{x^2 - 9x}$

(A)  $\infty$

(B)  $-\infty$

(C) DNE

(D) None of these

3. Determine all vertical asymptotes and points of discontinuities of the graph of  $f(x) = \frac{x^2 + 2x - 8}{x^2 - 4}$

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AP Calculus AB - Practice Spot Check/Quiz - 2.1 The Derivative and the Tangent Line Problem

1. Question

2. Question

(A)

(B)

(C)

(D)

3. Question

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AP Calculus AB - Practice Spot Check/Quiz - 2.2 Basic Differentiation Rules and Rate of Change

1.  $\frac{d}{dx} [5x^2 + 3x^3 - 2x]$

2.

t (sec)	0	10	20	30	40
V(t) m/sec	11.8	14.6	21.3	25.2	28.9

Given the above data find an approximation for  $V'(25)$  and use the correct units in your answer

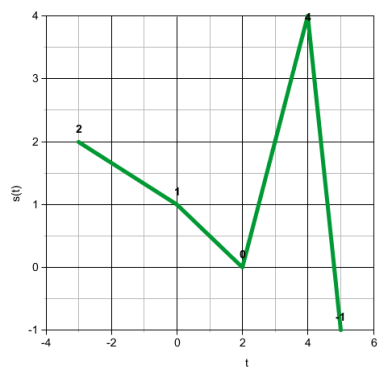
(A)  $0.477 \frac{\text{meter}}{\text{sec}^2}$

(B)  $0.380 \frac{\text{meter}}{\text{sec}^2}$

(C)  $0.530 \frac{\text{meter}}{\text{sec}^2}$

(D)  $0.390 \frac{\text{meter}}{\text{sec}^2}$

3. Given the following graph of  $s(t)$ , find  $s'(1)$



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AP Calculus AB - Practice Spot Check/Quiz - 2.3 Product and Quotient Rules and Higher Order

1. Question

$f(x) = x^3 \cos(x)$   
What is  $f(x)$  prime?

2.  $\frac{\sin(x)}{x^3} = ?$

(A)  $\frac{x \cos x - 3 \sin x}{x^4}$

(B)  $\frac{x \cos x - 3 \sin x}{x}$

(C)  $\frac{x \cos x - \sin x}{x^2}$

(D)  $\frac{2x \cos x - 3 \sin x}{x^4}$

3.

$\frac{d}{dx} [f(x)g(x)h(x)] = ?$

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AP Calculus AB - Practice Spot Check/Quiz - 2.4 Chain Rule

1.  $\frac{d}{dx} [\tan^2(3x)]$

2.  $\frac{d}{dx} [\cot(x) - \sqrt{3-x}]$

(A)  $-\csc^2(x) - \frac{1}{2\sqrt{3-x}}$

(B)  $-\csc^2(x) + \frac{1}{2\sqrt{3-x}}$

(C)  $\csc^2(x) - \frac{1}{2\sqrt{3-x}}$

(D)  $\csc^2(x) + \frac{1}{2\sqrt{3-x}}$

3. Evaluate the derivative of the function  $f(x) = \sqrt[5]{3x^3 + 4x}$  at the point (2,2).



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AP Calculus AB - Practice Spot Check/Quiz - 2.5 Implicit Differentiation

1. Question

2. Question

(A)

(B)

(C)

(D)

3. Question

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AP Calculus AB - Practice Spot Check/Quiz - 2.6 Related Rates

1. A spherical balloon is inflating so that the radius is increasing at a rate of 0.5 cm/sec. How fast is the volume of the balloon changing when the radius of the balloon is 12 cm?

2. A conical tank is 15 meters tall and has a radius of 10 meters. It is releasing water so that the water level is decreasing at a rate of  $\frac{1}{4}$  meters/sec. What is the change of volume of the tank when the water level is 10 meters tall?

(A)  $\frac{50\pi}{9} \frac{\text{meters}^3}{\text{sec}}$

(B)  $\frac{100\pi}{9} \frac{\text{meters}^3}{\text{sec}}$

(C)  $-\frac{50\pi}{9} \frac{\text{meters}^3}{\text{sec}}$

(D)  $-\frac{100\pi}{9} \frac{\text{meters}^3}{\text{sec}}$

3. A ladder that is  $c$  feet long rests against a vertical wall. If the bottom of the ladder slides away from the wall at a rate of  $\frac{db}{dt}$  then write out using variables how fast is the top of the ladder sliding down the wall when the bottom of the ladder is  $a$  feet from the wall?

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AP Calculus AB - Practice Spot Check/Quiz - 3.1 Extrema on the Interval

1. Question

Find the extrema of  $f(x)=3x^4 - 4x^3$  on the closed interval  $[-1, 2]$

2. Question

Let  $f$  be known at  $a$ . If  $f'(a) = 0$  or if  $f$  isn't differentiable at  $a$ , then  $a$  is a C.V of  $f$ .

(A) false

(B) true

3. Question

Sketch the graph of  $f$  and locate the absolute extrema over the interval  $[1, 5]$ .

$$f(x) = \begin{cases} 2 - x^2, & 1 \leq x < 3 \\ 2 - 3x, & 3 \leq x \leq 5 \end{cases}$$

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AP Calculus AB - Practice Spot Check/Quiz - 3.2 Mean Value Theorem

1. Let  $f(x) = x^3 - 4x + 5$  and let  $c$  be the number that satisfies the MVT for  $f$  on the interval  $[-2, 4]$ . What is  $c$ ?

2. Determine all the numbers  $c$  which satisfy the conclusions of the MVT for the function  $f(x) = x^3 + 2x^2 - x$  on the interval  $[-1, 2]$ .

(A)  $-4 \pm \frac{\sqrt{76}}{6}$

(B)  $-4 + \frac{\sqrt{76}}{6}$

(C)  $-4 - \frac{\sqrt{76}}{6}$

(D) None of them

3. Suppose that we know that  $f(x)$  is continuous and differentiable on  $[6, 15]$ . Let's also suppose that we know that  $f(6) = -2$  and  $f'(x) \leq 10$ . What is the largest possible value for  $f(15)$ ?

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AP Calculus AB - Practice Spot Check/Quiz - 3.3 INC/DEC Functions and the First Deriv. Test

1. Question

2. Question

(A)

(B)

(C)

(D)

3. Question

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AP Calculus AB - Practice Spot Check/Quiz - 3.4 Concavity and the Second Deriv. Test

1. Given the function  $y = 5x^2 - 4x^3 + 10$ , find the point of inflection

2. Given the function  $y = -3x^3 - 8x + 10$ , determine where the function is concave down

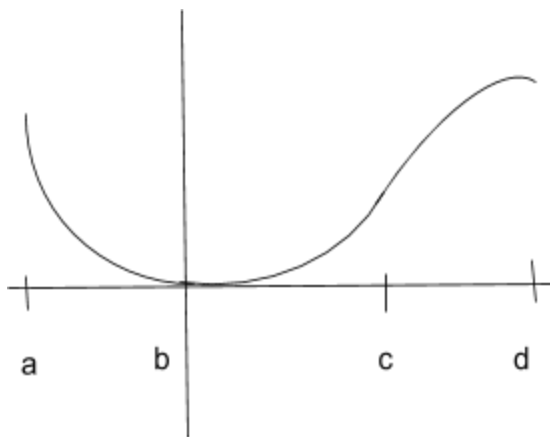
(A)  $x > -\frac{2}{3}$

(B)  $x < -\frac{2}{3}$

(C)  $x < \frac{3}{2}$

(D)  $x > \frac{3}{2}$

3. Given the following graph what letter represents the point of inflection?



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AP Calculus AB - Practice Spot Check/Quiz - 3.5 Limits at Infinity

1. Question

2. Question

(A)

(B)

(C)

(D)

3. Question

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AP Calculus AB - Practice Spot Check/Quiz - 3.6 A Summary of Curve Sketching

1. Sketch the graph of  $f(x) = \frac{2(x^2-1)}{x^2-4}$ . Find the domain, range, intercepts, critical values, and inflection points.

2. What are the critical values of  $y = x^4 - 3x^2$  on the interval  $[0, 8]$

(A)  $x=0, \sqrt{\frac{3}{2}}, -\sqrt{\frac{3}{2}}$

(B)  $x = -\sqrt{\frac{3}{2}}$

(C)  $x = \pm \sqrt{\frac{3}{2}}$

(D)  $x = \sqrt{\frac{3}{2}}$

3. Sketch the graph  $y = x^3 - 3x - 2$



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AP Calculus AB - Practice Spot Check/Quiz - 3.7 Optimization Problems

1. Question

2. Question

(A)

(B)

(C)

(D)

3. Question

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AP Calculus AB - Practice Spot Check/Quiz - 3.9 Differentials

1. Find the equation of the tangent line to the graph of  $v(x) = 5x^2 + 10$  if you are given the point  $(\frac{1}{2}, 4)$

2. What is the value of  $dy$  if  $x=2$  and  $\Delta x$  is equal to  $-.03$ , given the function  $y = 4x^2 + 5x$

(A)  $-0.630$

(B)  $-0.530$

(C)  $-0.730$

(D)  $-0.830$

3. Approximate the possible error of the area of a square calculus textbook, with a side length of 22 cm and a possible error of 0.02 cm.

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AP Calculus AB - Practice Spot Check/Quiz - 4.1 Antiderivatives and Indefinite Integration

1. Question

2. Question

(A)

(B)

(C)

(D)

3. Question

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AP Calculus AB - Practice Spot Check/Quiz - 4.2 Area

1. Find the area between the intervals of the x-axis of the given equation  $27x^3 - 5x^2 - 14x$  between the intervals  $[1,5]$

2. Find the area of the region that lies under the curve  $y = 15x^3 + 9x^2 - 4x$  from -2 to 2

(A) -48

(B) 56

(C) 48

(D) -56

3. Given  $\int_0^5 f(x)dx = 8$ ,  $\int_4^5 f(x)dx = 2$ ,  $\int_0^6 g(x)dx = 15$ ,  $\int_6^5 g(x)dx = -4$ ,  $\int_4^5 g(x)dx = 6$ , what is

$\int_0^4 (f(x) + g(x))dx$ ?

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AP Calculus AB - Practice Spot Check/Quiz - 4.3 Riemann Sums and Definite Integrals

1. Question

2. Question

(A)

(B)

(C)

(D)

3. Question

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AP Calculus AB - Practice Spot Check/Quiz - 4.4 The Fundamental Theorem of Calculus

1. Given  $g(x) = \int_1^x 3x^3 - 5x^2 \, dx$ , find  $g'(4)$

2. Given  $v(x) = \int_0^x \sin(x) + \cos(x) \, dx$ , find  $v'(\pi)$

(A)  $\frac{1}{2}$

(B) 4

(C) 2

(D) 6

3. Given the following function  $f(x) = \int_1^b g'(x) \, dx$  write out how you would solve for  $f'(b)$

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AP Calculus AB - Practice Spot Check/Quiz - 4.5 Integration by Substitution

1. Question

2. Question

(A)

(B)

(C)

(D)

3. Question

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AP Calculus AB - Practice Spot Check/Quiz - 4.6 Numerical Integration (Trapezoidal)

1. Find the area under the curve using the trapezoidal rule using the function  $f(x) = \sqrt{2x-1}$   $[1, 6]$

2. Find the area under the curve using the trapezoidal rule using the function  
 $f(x) = 4x^2 + 5x - 1$   $[1, 3]$

(A) 108

(B) 56

(C) 54

(D) 70.5

3. Approximate the area between the curve  $f(x) = x^3 - x + 1$  and the x-axis on the interval  $[0, 2]$  using 4 rectangles and the Trapezoidal Rule



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AP Calculus AB - Practice Spot Check/Quiz - 5.1 The Natural Logarithmic: Differentiation

1. Question

2. Question

(A)

(B)

(C)

(D)

3. Question

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Pd: \_\_\_\_ 2017  
AP Calculus AB - Practice Spot Check/Quiz - 5.2 The Natural Logarithmic Function: Integration

1. Question

2. Question

(A)

(B)

(C)

(D)

3. Question

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AP Calculus AB - Practice Spot Check/Quiz - 5.4 Exponential: Differentiation and Integration

1. Question

2. Question

(A)

(B)

(C)

(D)

3. Question

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AP Calculus AB - Practice Spot Check/Quiz - 5.5 Bases other than e and Applications

1.  $\frac{d}{dx} [7^x e^x]$

2.  $\frac{d}{dx} [\ln(5^{2x} - e^{3x})]$

(A)  $5^{2x} 2 \ln 5 - 3e^{3x}$

(B)  $\frac{1}{5^{2x} - e^{3x}}$

(C)  $5^{2x} - e^{3x}$

(D)  $\frac{5^{2x} 2 \ln 5 - 3e^{3x}}{5^{2x} - e^{3x}}$

3. Find  $\frac{dy}{dx}$  of  $y = x^{\sin(x)}$

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AP Calculus AB - Practice Spot Check/Quiz - 5.6 Inverse Trigonometric: Differentiation

1. Question

2. Question

(A)

(B)

(C)

(D)

3. Question

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Pd: \_\_\_\_ 2017  
AP Calculus AB - Practice Spot Check/Quiz - 5.7 Inverse Trigonometric: Integration

1. Question

2. Question

(A)

(B)

(C)

(D)

3. Question

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AP Calculus AB - Practice Spot Check/Quiz - 6.2 Differential Equations: Growth/ Decay/ Logistic

1. Question

2. Question

(A)

(B)

(C)

(D)

3. Question

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AP Calculus AB - Practice Spot Check/Quiz - 6.3 Differential Equations: Separation of Variables

1. Find the solution of  $2xy' - \ln(x)^2 = 0$ ,  $y(1) = 2$

2.  $\frac{dy}{dx} = \frac{2x}{y}$

(A)  $\pm \sqrt{2x^2 + C}$

(B)  $-\sqrt{2x^2 + C}$

(C)  $\sqrt{2x^2 + C}$

(D) None of them

3. In 1955, a tree had a radius of 5 feet. In 1970, it has a radius of 6.2 feet. How much did the area change?



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AP Calculus AB - Practice Spot Check/Quiz - 7.1 Area of a Region Between Two Curves

1. Question

2. Question

(A)

(B)

(C)

(D)

3. Question

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AP Calculus AB - Practice Spot Check/Quiz - 7.2 Supplement - Volume: By Cross-Sections

1. Question

2. Question

(A)

(B)

(C)

(D)

3. Question

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AP Calculus AB - Practice Spot Check/Quiz - 7.2 Supplement - Volume: The Disk and Washer Method

1. Question

2. Question

(A)

(B)

(C)

(D)

3. Question

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Pd: \_\_\_\_ 2017  
AP Calculus AB - Practice Spot Check/Quiz - 8.7 Indeterminate Forms and L'Hopitals Rule

1.  $\lim_{x \rightarrow 0} \frac{1 - \cos(x)}{x^2}$

2.  $\lim_{x \rightarrow 2} \frac{\sqrt{2+x}-2}{x-2}$

(A)  $\frac{1}{4}$

(B)  $\frac{\sqrt{2}-2}{-2}$

(C) 2

(D)  $\frac{1}{2}$

3. Explain the steps needed to solve a limit equation using L'Hopital's Rule