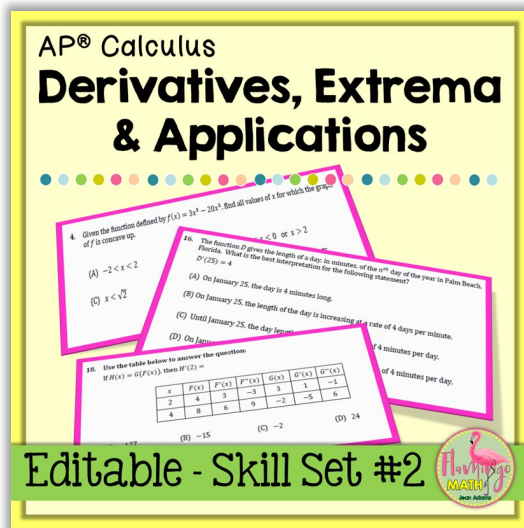




KEY CONCEPTS/TOPICS:

Topic 3.2 Implicit Differentiation
Topic 4.1 Interpreting the Meaning of the Derivative in Context
Topic 4.2 Connecting Position, Velocity & Acceleration
Topic 4.5 Solving Related Rates Problems
Topic 4.6 Using Local Linearity and Linearization
Topic 4.7 Using L'Hospital's Rule
Topic 5.1 Using the Mean Value Theorem
Topic 5.2 Extreme Value Theorem
Topic 5.3 Intervals of Increasing or Decreasing
Topic 5.4 Using the First Derivative Test to Determine Extrema
Topic 5.6 Determining Concavity of Functions
Topic 5.11 Solving Optimization Problems

Product Overview

Your Calculus students will practice AP-Style multiple choice questions related to the units 3 through 5 in the CED Binder with this 20-question skill set. The fully-editable resource is designed as a series of “Multiple Choice Monday” Exam Prep and Practice. All questions in the set are non-calculator prompts and should be able to be completed in a 40 to 50-minute class period.

Multiple Choice Monday

Multiple Choice Monday Derivatives, Extrema & Applications

Name _____

1. For what value of x does the function $f(x) = (x-2)(x-3)^2$ have a relative maximum?

(A) -3 (B) $\frac{7}{2}$ (C) $\frac{5}{2}$ (D) $-\frac{7}{2}$

2. If $f(x) = \sin\left(\frac{x}{2}\right)$ then there exists a number c in the interval $\frac{\pi}{2} < x < \frac{3\pi}{2}$ such that the conclusion of the Mean Value Theorem. Which of the following is the value of c ?

(A) $\frac{2\pi}{3}$ (B) $\frac{3\pi}{2}$ (C) $\frac{\pi}{2}$ (D) $\frac{5\pi}{2}$

3. The function $y = x^4 - 4x^3 + 6x^2 - 4x + 1$ has a local maximum at $x = 1$ and a local minimum at $x = 2$. Which of the following is the value of y at $x = 1$?

(A) 0 (B) 1 (C) 2 (D) $y = 4x + 1$

4. The function $f(x) = x^3 - 3x^2 + 2x$ is defined on the interval $[-2, 2]$. Which of the following is the maximum value of $f(x)$ on this interval?

(A) 0 (B) $-2 < x < 0$ or $x > 2$
(C) $x = 0$ (D) $-\sqrt{2} < x < 0$ or $x > \sqrt{2}$

5. If $f(x) = (\sin x - \cos x)^2$, then the equation of the normal line to the graph of f through $(0, 1)$ is

(A) $2x - 2y = -2$ (B) $2x - 2y = 2$ (C) $2y - x = 2$ (D) $x = 2$

6. A particle moves along a horizontal line. The position of the particle at time t is given by $s(t) = t^3 - 6t^2 + 9t$. The particle is increasing at a constant rate of 32π units per second when $t = 8\pi$. Which of the following is the value of $s(8\pi)$?

(A) 8π (B) 16π (C) 24π (D) 32π

7. The function g is given by $g(x) = x^3 - 3x^2 + 2x$. Which of the following intervals is g increasing?

(A) $(-\infty, 0)$ (B) $(0, 1)$ (C) $(1, \infty)$ (D) $\left(\frac{2}{3}, \infty\right)$

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

(A) $12\pi^2 - 1$ (B) $12\pi^2$ (C) $12\pi^2 + 1$ (D) $6\pi - 1$

9. If $x^2 + 3xy + 2y^2 = 17$, then in terms of x and y $\frac{dy}{dx} =$

(A) $-\frac{x^2+y}{x+y^2}$ (B) $-\frac{x^2+y}{x+2y^2}$ (C) $-\frac{x^2+y}{x+2y}$ (D) $-\frac{x^2+y}{2y^2}$



Students gain valuable practice for AP Calculus Exam concepts

10. The maximum acceleration attained on the interval $0 \leq t \leq 3$ by the particle whose velocity is given by $v(t) = t^3 - 3t^2 + 12t + 4$ is

(A) 9 (B) 12 (C) 14 (D) 21

11. Let f be a polynomial function with degree greater than 2. If $a \neq b$ and $f(a) = f(b) = 1$, which of the following must be true for at least one value of x between a and b ?

- I. $f(x) = 0$
II. $f'(x) = 0$
III. $f''(x) = 0$

(A) I only (B) II & III only (C) II only

12. The graph of $y = \frac{1}{x}$ has a horizontal asymptote at $y = 0$ and a vertical asymptote at $x = 0$. Which of the following is true?

13. The graph of $y = \frac{1}{x}$ has a horizontal asymptote at $y = 0$ and a vertical asymptote at $x = 0$. Which of the following is true?

14. What is the linearization of $f(x) = e^x$ centered at $x = 1$?

(A) $L(x) = e^x$ (B) $L(x) = x - e$ (C) $L(x) = ex$ (D) $L(x) = ex - e$

15. The function f is differentiable at $x = 1.9$. Which of the following is the best approximation of $f(1.9)$?

(A) 3.4 (B) 2.6

16. The function D is defined by $D(t) = 4t^2 + 1$, where t is time in days. What is the interpretation for the following?

- (A) On January 25, the length of the day is increasing at a rate of 4 minutes per day.
(B) On January 25, the length of the day is increasing at a rate of 4 days per minute.
(C) On January 25, the length of the day is increasing at a rate of 4 minutes per day.
(D) On January 25, the length of the day is increasing at a rate of 4 days per minute.

17. What are all values of x for which the function f defined by $f(x) = (x^2 - 3)e^{-x}$ is increasing?

(A) $x < -1$ and $x > 3$ (B) $-3 < x < 1$
(C) $-1 < x < 3$ (D) all values of x



18. Use the table below to answer the question:

If $H(x) = G(F(x))$, then $H'(2) =$

x	$F(x)$	$F'(x)$	$F''(x)$	$G(x)$	$G'(x)$	$G''(x)$
2	4	3	-3	3	1	-1
4	8	6	9	-2	-5	6

- (A) -127 (B) -15 (C) -2 (D) 24

19. A manufacturer produces tripod stands for cell phones that retail for \$15. The fixed costs for the company are \$23,500, and the variable cost for each stand is \$3.50. What is the profit function for manufacturing and selling x stands?

(A) $P(x) = 12.50x - 23,500$

(C) $P(x) = 12.50x$

$\lim_{x \rightarrow 5}$

(A) $-\frac{1}{5}$

(B) $\frac{3}{5}$

(C) $\frac{9}{5}$

(D) does not exist

Name _____ Date _____ Period _____

AP CALCULUS

Mult.

Monday

I. Multiple Choice (No Calculator)

1.	(A)	(B)	(C)	(D)
2.	(A)	(B)	(C)	(D)
3.	(A)	(B)	(C)	(D)
4.	(A)	(B)	(C)	(D)
5.	(A)	(B)	(C)	(D)
6.	(A)	(B)	(C)	(D)
7.	(A)	(B)	(C)	(D)
8.	(A)	(B)	(C)	(D)
9.	(A)	(B)	(C)	(D)
10.	(A)	(B)	(C)	(D)
11.	(A)	(B)	(C)	(D)
12.	(A)	(B)	(C)	(D)
13.	(A)	(B)	(C)	(D)
14.	(A)	(B)	(C)	(D)
15.	(A)	(B)	(C)	(D)
16.	(A)	(B)	(C)	(D)
17.	(A)	(B)	(C)	(D)
18.	(A)	(B)	(C)	(D)
19.	(A)	(B)	(C)	(D)
20.	(A)	(B)	(C)	(D)



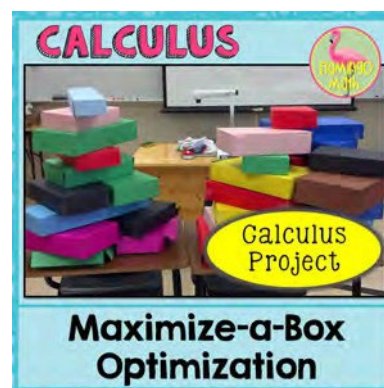
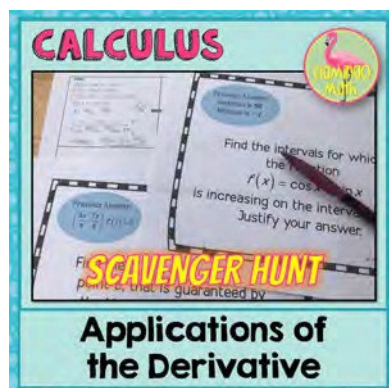
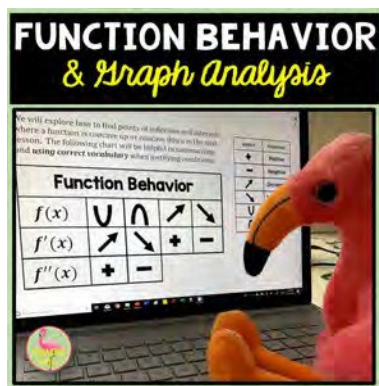
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