Grade 12 math's unit 2

Introduction to Calculus

UEE [2005-2016]

Section 1: Introduction to Derivatives

Section 2: Application of Derivative

Section 3: Introduction to Integration

Z Secret Training Institute

Section 1

UEE [2005-2016]

Introduction to Derivatives

1. The Equation of the line tangent to the graph of f(x) = $\frac{1}{x+1} + \sqrt{x^2+1}$ at (0,f(0))….(UEE 2005)

A. y + x = 1 B. y - x = 1 C. y + x = 2 D. x + 4y = 2

Z Secret Training Institute

2. If g(x) = xf(x)-$\sqrt{f(x)}$ and f(2) = f'(2) = 4 then which of the following is equal to g'(2)....(UEE 2005)

A. 11 B. 8 C. 2 D. 0

Z Secret Training Institute

3. If f(x) = $x^2 + 2\sqrt{x}$ then what is $\frac{f(4+h)-f(4)}{h}$, h gets very close to zero from both sides ….(UEE 2005)

A. 2/17 B. 17/2 C. -2/17 D. -17/2

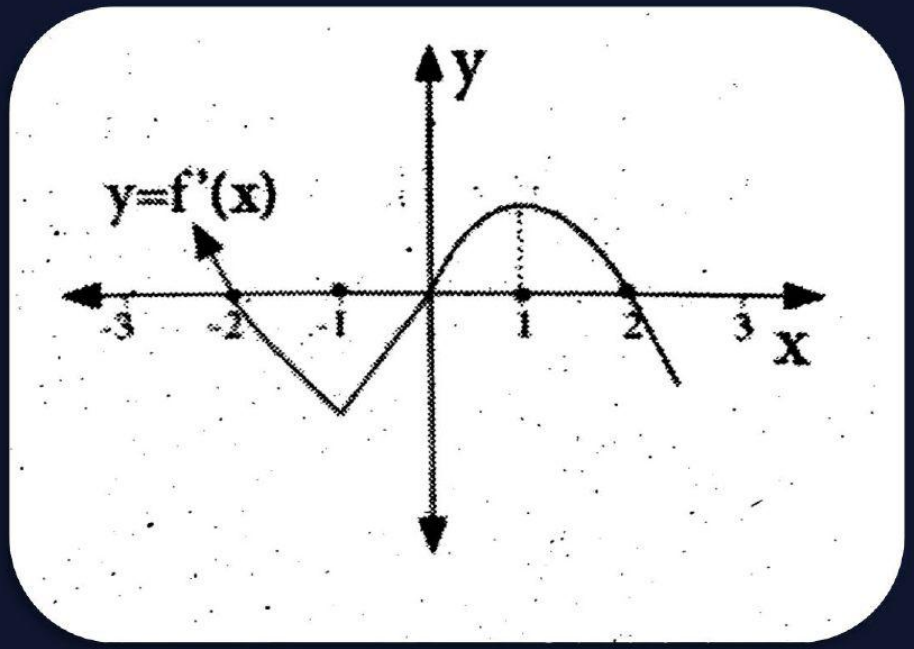
Z Secret Training Institute

4. On which of the following intervals does $f(x) = x^4+4x$ increasing on (UEE 2005)

A. $(-\infty, -1]$ B. $(-\infty, 0]$ C. $[-1, \infty)$ D. $(-\infty, \infty)$

Z Secret Training Institute

5. Suppose f is differentiable on (- ∞, ∞) and the graph of its derivative is as shown below



Which one of the following is true about f?

(UEE 2005)

A. f is decreasing on (-∞, ∞)

B. f has a local maximum at x = 0

C. f has a local minimum at x = -2 and x =2

D. f is increasing on (-∞, -2] U [0, 2]

Z Secret Training Institute

6. At which value(s) of x does $f(x) = \frac{1}{4}x^4 - 2x^2$ have a local maximum (UEE 2005)

A. x = 4 B. x = 0 C. x = 0 and x = 2 D. x = -2 and x = 2

Z Secret Training Institute

7. If f(x) = $x^2\sqrt{2x+12}$, what is the slope of the tangent line to the graph of f at x = 2 (UEE 2006)

A. - 4 B. 2 C. 18 D. 17

Z Secret Training Institute

8. Suppose, g(2) = 1, g'(2) = 10 and f(x) = $\frac{x^2}{1+xg(x)}$, then the value of f'(2) is equal to____ (UEE 2006)

A. -8 B. -8/9 C. 4/3 D. 8/9

Z Secret Training Institute

9. If $F(x) = f(2x+2).g(1-x^2)$ with $f(2) = -3$, $f'(2) = 4$, $g(1) = -5$ and $g'(1) = 1$, then what is the value of $F'(0)$? UEE 2006)

A. -40 B. -20 C. 0 D. 19

Z Secret Training Institute

10. What is the absolute maximum value of $f(x) = 2x^2 - x^4 - 4$ on $[0, 2]$? (UEE 2007)

A. -3 B. 3 C. -4 D. 12

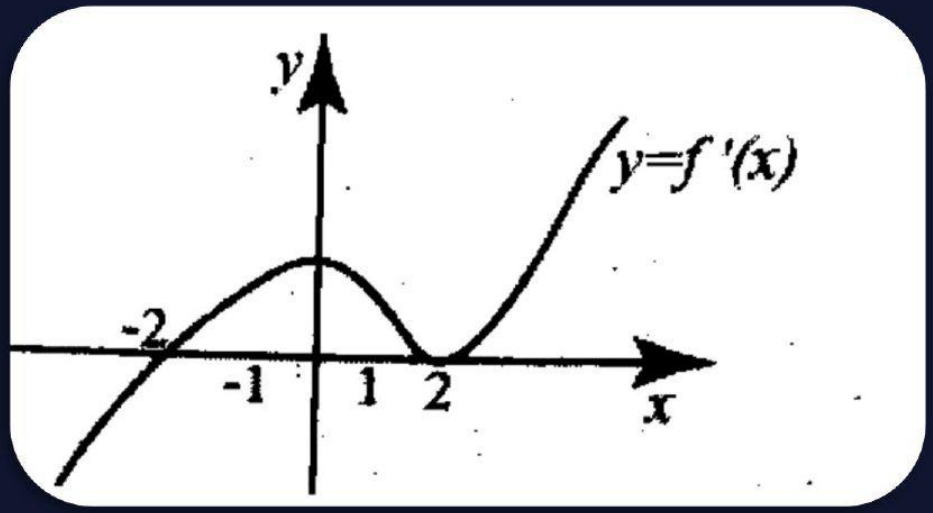
Z Secret Training Institute

11. If f(x) = $2x^5 - 3x$ then what is $\frac{f(x)-f(1)}{x-1}$, x gets very close to 1 ….(UEE 2008)

A. 1 B. -1 C. 7 D. ∞

Z Secret Training Institute

12. Suppose f(x) is differentiable on (-∞, ∞) and the graph of its derivative, y=f'(x) is as shown in the following figure. Which one of the following is true about f(x)? (UEE 2008)



A. f(x) is increasing on (- ∞, 0) U (2,∞).

B. f(x) has a local extreme value at x = 2.

C. f(x) has a local minimum value at x = -2.

D. f(x) has a local maximum value at x = 0

Z Secret Training Institute

13. If $f(x) = 2 + |x-3|$ for all x, then the value of the derivative $f'(x)$ at $x=3$ is….(UEE 2008)

A. -1 B. does not exist C. 1 D. 2

Z Secret Training Institute

14. If f(x) = π^2 + 1, Then what is the value of f'(x)? (UEE 2009)

A. 2π+1 B. 2π C. 2 D. 0

Z Secret Training Institute

15. What is the equation of tangent line to the graph of $f(x) = 3x^2+4x-5$ at (1,2)? (UEE 2009)

A. $10x-y-8 = 0$ B. $-10x-y-8 = 0$ C. $-10x+y-8 = 0$ D. $10x+y-8 = 0$

Z Secret Training Institute

16. If $x^2 + xy = 10$, then that is the value of dy/dx when x = 2?(UEE 2009)

A. 2/7 B. -7/2 C. 3/2 D. 7/2

Z Secret Training Institute

17. Suppose f: $(-\infty, \infty) \rightarrow R$ is differentiable and the graph of its derivative, $y = f'(x)$, is as shown in the figure below.?

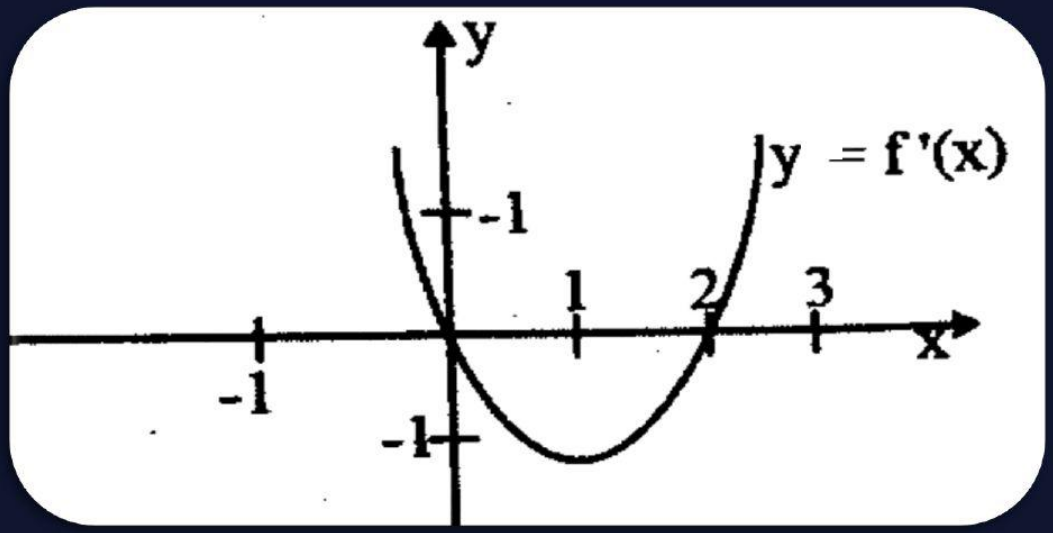
Which one of the following is true about f? (UEE 2009)

A. f is increasing on $(1, \infty)$

B. f is increasing on $(2, \infty)$

C. f has no relative maximum value

D. f has a relative minimum value at $x = 2$



Z Secret Training Institute

18. Which one of the following is the set of critical numbers of $f(x) = \frac{4}{3}x^3 + |x|$? (UEE 2009)

A. $\{\frac{1}{2}\}$ B. $\{0, \frac{1}{2}\}$ C. $\{-\frac{1}{2}, 0\}$ D. $\{-\frac{1}{2}, 0, \frac{1}{2}\}$

Z Secret Training Institute

19. If $2 \leq f'(x) \leq 4$ for all values of x, then the value of $f(8) - f(2)$ is between which of the following numbers? (UEE 2009)

A. 14 and 24 B.12 and 24 C. 12 and 18 D. 8 and 10

Z Secret Training Institute

20. Let f be a differentiable function with $f(1) = -1$ and $f'(1) = 1$, if $g(x) = [f(2x+1)+2]^2$ then what is the value of $g'(0)$? (UEE 2009)

A. 2 B. 4 C. -2 D. -4

Z Secret Training Institute

21. If $f(x) = \alpha x^3 + \frac{b}{x} + 5$ has a local minimum value at (2, -3), then what are the values of a and b? (UEE 2011)

A. a= -1/4 , b = -12

B. a = - 1/4, b = 12

C. a=1/4, b = 12

D. a= ¼ , b = -12

Z Secret Training Institute

22. Which one of the following is the set of critical numbers of $f(x)= \frac{3}{8}x^{8/3} - 6x^{2/3}$?

(UEE 2011)

A. {-2, 0, 2}

B. {-1, 1}

C. {-1, 0, 1}

D. {-2, 2}

Z Secret Training Institute

23. At what value of x does the function $f(x) = \frac{4}{3}x^3 - x^4$ attains its maximum value?

(UEE 2011)

A. 1

B. 1/3

C. -1

D. 4/3

Z Secret Training Institute

24. If h(x) = $\sqrt{1+\sqrt{x}}$, then which of the following is equal to h'(x)?(UEE 2011)

A. $\frac{1}{2\sqrt{1+\sqrt{x}}}$ B. $\frac{x}{2\sqrt{1+\sqrt{x}}}$ C. $\frac{x}{4\sqrt{x+x\sqrt{x}}}$ D. $\frac{1}{4\sqrt{x+x\sqrt{x}}}$

Z Secret Training Institute

25. Let $f(x) = x^2 + 2x + 3$ find a number $c \in (1, 3)$ such that $f'(c) = \frac{f(3)-f(1)}{2}$?(UEE 2012/13)

A. 2 B. 6 C. -2 D. -6

Z Secret Training Institute

26. If f(x) = $\frac{1}{(1-\sqrt{x})^2}$ then f'(4) is equal to?(UEE 2012/13)

A. $\frac{1}{2}$ B. 1 C. $-\frac{1}{2}$ D. 2

Z Secret Training Institute

27. Given the function $f(x)=2x^2-3x+1$, what is slope of the line passing through the points (-1, f(-1)) and (2, f(2)) **(UEE 2012/13)**

A. 1 B. 1/3 C. -1 D. -1/3

Z Secret Training Institute

28. The equation of tangent line to the graph of f(x) = $\frac{3x}{x-1}$ at ((2,f(2)) (UEE 2012/13)

A. 1 B. 1/3 C. -1 D. -1/3

Z Secret Training Institute

29. Which of the following is the same as the derivative of a function f at a point P, where P is on the graph of f?(UEE 2013/14)

A. The slope of the tangent line through P.

B. The Graph of f has no jump at P.

C. The slope of the secant line through P.

D. The continuity of the function at p.

Z Secret Training Institute

30. What is the derivative of the function $f(x)=3x^2+2\sqrt{x}-x$ at $x=1$? (UEE 2013/14)

A. -3 B. 1 C. 3 D. -1

Z Secret Training Institute

31. Which of the following is true about the function defined by $f(x)=x^3-3x^2$ on [-1, 3] ? (UEE 2013/14)

A. It has critical numbers at 0 and 2 and its maximum value is 0.

B. Its critical numbers are 0 and 2 and its maximum value is -4.

C. Its critical numbers are 0 and 2 and its

D. Its critical numbers are 0, 2, 3 and its maximum value is 15. maximum value is 0.

Z Secret Training Institute

32. If f'(1) = 4, f(1) = 3 and g'(3) = 5 then (gof)'(1) is equal to?(UEE 2013/14)

A. 3 B. 15 C. 5 D. 20

Z Secret Training Institute

33. Which of the following describes the mechanical meaning of derivative?(UEE 2015)

A. Slope of the tangent Line

B. Instantaneous rate of change

C. Area under the curve

D. Gradient of graph of functions

Z Secret Training Institute

34. Let f and g be differentiable functions and $h(x) = g(f(3x+1))$. If $f'(1)=f(1) = 2$ and $g'(2) = 1$, then what is the value of $h'(0)$?**(UEE 2015)**

A. 4 B. 1 C. 6 D. 2

Z Secret Training Institute

35. Let $f(x) = \frac{1}{\sqrt{x}}$ and $g(x) = 2 - \frac{1}{6}x^3$ be two functions. For what values of x do the graph of f and g have tangent lines of the same slope? **(UEE 2015)**

A. 4 B. 1/4 C. $\sqrt{3}$ / 2 D. 1

Z Secret Training Institute

36. Let $f(x) = \frac{1}{\sqrt{x}}$ and $g(x) = 2 - \frac{1}{6}x^3$ be two functions. For what values of x do the graph of f and g have tangent lines of the same slope?(UEE 2015)

A. 4 B. 1/4 C. $\sqrt{3}$ / 2 D. 1

Z Secret Training Institute

37. Let f be differentiable function at a number 'a' for a $\in$ Domain f. In the expression $\frac{f(a+h)-f(a)}{h}$ for $h \neq 0$, as h gets closer and closer to zero from both directions, the expression becomes closer to f'(a) which is equal to (UEE 2016)

A. The gradient of the vertical line to the graph of f at a point (a, f(a)).

B. The gradient of the normal line to the graph of f at a point (a, f(a)).

C. The gradient of the tangent line to the graph of f at a point (a, f(a)).

D. The gradient of the secant line to the graph of f at a point (a, f(a)).

Z Secret Training Institute

Thank you!!!!