هام

لكل المهتمين و المهتمات
بدروس و مراجع الجامعية

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B

11) The equation of the tangent line of $y = \sqrt{x}$ at (4,2) is

A) $\frac{1}{4}x - 1$ B) $-\frac{1}{4}x - 1$ C) $\frac{1}{4}x + 1$ D) $-\frac{1}{4}x + 1$

12) The function $f(x) = \frac{x^2+x-12}{x^2-2x+1}$ is continuous at $x \in$

A) $R - \{1, -1\}$ B) $\{-1, 1\}$ C) $R - \{1\}$ D) $\{1\}$

13) If $f(x) = (g(x))^n$, then $f'(x) = n(g(x))^{n-1} + g'(x)$

A) True B) False

14) If $f(x) = (2x-1)^3$ then $f'(0) =$

A) 3 B) 6 C) -3 D) -6

15) The tangent line of $y = x^2e^x + 1$ is horizontal at $x =$

A) 4 B) 2 C) 0 D) -4

16) If $f(x) = e^4$, then $f'(x) =$

A) 0 B) $4e^3$ C) $-4e^3$ D) e^4

17) The value of c of $f(x) = 2 - \frac{3}{x}$ in the interval(1,3) such that $f'(c) = \frac{f(3)-f(1)}{3-1}$ is

A) $-\sqrt{3}$ B) $\sqrt{3}$ C) 3 D) -3

18) If $f(x) = \frac{secx}{1+secx}$, then $f'(0) =$

A) 0 B) π C) 3π D) -2

19) If $f(x) = x^3$, then $\lim_{h\to 0} \frac{f(x+h)-f(x)}{h} =$

A) $3x^2$ B) $3x^3 - h$ C) $2x$ D) $x + h$

20) $f(x) = x^3 + 2x^2 - 1$ has a value of 4 in [0,1]

A) True B) False

21) If $f(x) = x^4 - x^3 + x^2 - \pi x + 4$, then $f^{(4)}(x) =$

A) 0 B) $24x$ C) 24 D) 12

22) If $f(x) = log_{10}(cosx)$, then $f'(x) =$

A) $\frac{tanx}{ln(10)}$ B) $-\frac{tanx}{ln(10)}$ C) $\frac{cotx}{ln(10)}$ D) $-\frac{cotx}{ln(10)}$

B

Complete:

41) $\int tanx\,dx =$ ..... $\int sec^2 x$ .....

42) $\int \frac{1}{x^3}\,dx =$ ..... $\int x^{-3} = \frac{x^{-4}}{-4}$ .....

43) $\int_0^{\frac{\pi}{3}} cos(3x)\,dx =$ ..... $\frac{\sin(3x)}{3}\Big|_0^{\frac{\pi}{3}} = 0$ .....

44) $\int_0^1 (3x-1)^3\,dx =$ ..... $\frac{(3x-1)^4}{12}$ .....

45) $\lim_{x\to\infty} \frac{2x^3-4}{x^2-1} =$ ..... ∞ .....

46) If $f(x) = e^x$, *then* $f''(x) =$ .....

47) The critical number of $f(x) = f(x) = x^2 - 4x$ is ..... $2x-4=0 \Rightarrow \frac{2x}{2} = \frac{4}{2}$ .....

48) The function $f(x) = \frac{x^2+x-12}{2x+6}$ is continuous on .....

49) The value of c of $f(x) = x\sqrt{x-2}$ in the interval $[-2,0]$ such that $f'(c) = 0$ is

..... $\frac{1}{2\sqrt{x-2}} = \frac{\sqrt{x-2}}{2}$ .....

50) *Find the interval on which* $f(x) = \frac{2x}{x^2+1}$ is increasing .....

End

B

33) $\int \sec(4x)\tan(4x)dx =$

A) $\frac{\sec(4x)}{4}+c$ B) $-\frac{\sec(4x)}{4}+c$

C) $4\sec(4x)+c$ D) $-4\sec(4x)+c$

34) $\int \csc^2(kx)\,dx = -\frac{\cot(kx)}{k}+C$

A) True B) False

35) $\int (x^2+7)\,dx =$

A) $\frac{x^3}{3}+7+c$ B) $\frac{x^3}{3}+7x+c$

C) $-\frac{x^3}{3}+7x+c$ D) $\frac{x^3}{3}-7x+c$

36) $\int_4^4 \frac{dx}{3x+2} =$

A) 1 B) -2 C) 3 D) 0

37) $\int_a^b f(x)\,dx = -\int_a^a f(x)\,dx$

A) True B) False

38) $\int e^{-x}\,dx =$

A) e^{-x} B) $-e^{-x}$ C) e^{-2x} D) $-e^{-2x}$

39) If $\int_{-2}^{2} f(x)\,dx = 0$, then $f(x) =$

A) x B) x^2 C) $\cos x$ D) x^6

40) $\int 5^x\,dx =$

A) $\frac{5^x}{\ln 5}+c$ B) $\frac{5^{x-1}}{\ln 5}+c$ C) $5^x \ln 5 + c$ D) $5\ln 5^{x-1}+c$

B

Choose the correct answer:

1) If $f(x) = \sqrt{x+7}$ then $f'(x) =$

$A) -\frac{1}{2\sqrt{x+7}}$ $B) \frac{1}{\sqrt{x+7}}$ $C) \frac{1}{2\sqrt{x+7}}$ $D) -\frac{1}{\sqrt{x+7}}$

2) $\lim_{x\to\infty} cos^{-1}\left(\frac{2+x}{2x+1}\right) =$

$A) \frac{\pi}{2}$ B) $\frac{\pi}{6}$ C) $\frac{\pi}{3}$ D) $\frac{\pi}{4}$

3) The value of a that makes $f(x) = \begin{cases} 5x-2, & x \geq 2 \\ ax^2+4, & x < 2 \end{cases}$ continuous is $a =$

$A) 1$ $B) -1$ $C) 2$ $D) -2$

4) The function $\begin{cases} \frac{x^2+2x-3}{x-1}, & x \neq 1 \\ 5, & x = 1 \end{cases}$ is discontinuous at $x =$

$A) -1$ B) 1 C) $R-\{1\}$ D) $(-\infty, 0)$

5) The Difference Quotient of $f(x) = 3x^2 + 4$ is

$A) 6x+3h$ B) $6x-2h$ C) $6x-3h$ D) $6x+2h$

6) $\lim_{x\to 2} sin\left(\frac{\pi(x-2)}{x^2-4}\right) =$

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

7) If $f(x) = \sin x^3$, then $f'(x) =$

$A) 3x^2 \cos x^3$ B) $x^3 cosx^3$ C) $3x^2 \sin x^3$ D) $x^3 \sin x^3$

8) If $f(x) = (x + x^{-2})^4$, then $f'(x) =$

$A) (4-2x^{-3})(x+x^{-2})^3$ B) $4(4-8x^{-3})(x+x^{-2})^3$

C) $(1-2x^{-3})(x+x^{-2})^3$ D) $(4-8x^{-3})(x+x^{-2})^3$

9) If $x^2y^2 = 8$, then $y'(x) =$

$A) -\frac{y}{x}$ B) $\frac{y}{x}$ C) $-\frac{x}{y}$ D) $\frac{x}{y}$

10) $D_x^{27}(sinx) =$

$A) sinx$ B) $\cos x$ C) $-sinx$ D) $-\cos x$

B

23) *If* $y = ln(x - y) = 6x^2 + 3$, *then* $y' =$

A) $12x(x - y)$ *B*) $1 + 12x(x - y)$

C) $1 - 12(x - y)$ *D*) $1 - 12x(x - y)$

24) $\lim_{x \to 0} \frac{sinx}{x} =$

A) 0 *B*) 2 *C*) 1 *D*) ∞

For $f(x) = x^3 - \frac{3}{2}x^2 + 1$. Answer the following six questions

25) The critical numbers are

A) $0, -1$ *B*) $1, 2$ *C*) $0, -2$ *D*) $0, 1$

26) $f(x)$ has local maximum at $x =$

A) 0 *B*) -2 *C*) 2 *D*) 1

27) $f(x)$ has local minimum at $x =$

A) 0 *B*) -2 *C*) 2 *D*) 1

28) $f(x)$ is increasing on the interval

A) $(-\infty, 0) \cup (1, \infty)$ *B*) $(-\infty, 0) \cup (2, \infty)$ *C*) $(0,1)$ *D*) $(0, -2)$

29) $f(x)$ is decreasing on the interval

A) $(0, -2)$ *B*) $(-\infty, 0) \cup (2, \infty)$ *C*) $(-\infty, 0) \cup (1, \infty)$ *D*) $(0,1)$

30) $f(x)$ has inflection point at $x =$

A) $-\frac{1}{2}$ *B*) $\frac{1}{2}$ *C*) 1 *D*) 0

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31) The graph of $f(x) = x^4 - x$ on the interval $(-3,3)$ is

A) concave up B) concave down

32) The graph of $f(x) = sinx$ on the interval $(0, \pi)$ is

A) concave up B) concave down