A

1 Find the length of the line segment joining points (0, 1) and (-2, -1).

A) 8
B) $2\sqrt{3}$
C) $2\sqrt{2}$
D) 4
E) 12

2 What is the equation of the line through point $P(2, -1)$ with slope $m = 4$?

A) 4x - y - 9 = 0
B) y = 2x - 5
C) 4x + y = 7
D) y = 4x + 9
E) 4x + y + 9 = 0

3 Find the derivative of

$$F(x) = \int_{1/x}^{x} \ln u \, du$$

A) - ln xn
B) $\dfrac{(x^2-1)\ln x}{x^2}$
C) 2 ln x
D) 0
E) none of the above

4 Compute the integral

$$\int_0^{\pi/4} \cos x \, dx$$

A) 1/2
B) $\sqrt{2}/2$
C) $-\sqrt{2}/2$
D) -1/2
E) none of the above

A

5 Find the derivative of $f(t) = \sin^3(4t)$.

A) $12 \sin^2(4t) \cos(4t)$
B) $12 \cos^2(4t)$
C) $12 \sin^2(4t) \sin(4t)$
D) $6 \sin^2(4t) \cos(4t)$
E) none of the above

6 Use implicit differentiation to find $\dfrac{dy}{dx}$, if

$x^3 + y^3 = 6xy$

A) $\dfrac{2y - x^2}{y^2 - 2x}$
B) $\dfrac{2y - x^2}{y^2 + 2x}$
C) $\dfrac{2y + x^2}{y^2 - 2x}$
D) $\dfrac{2y - 2x^2}{y^2 - 2x}$
E) none of the above

7 Calculate the derivative of the given function at the point x = 2.

$$f(x) = \frac{(x^2+1)(x+1)}{(x^2-3)}$$

A) - 23
B) - 43
C) 23
D) 76
E) none of the above

A

8 Find an equation of the line tangent to the curve $y = x^3 + 1$ at the point where $x = 2$.

A) $y = -12x + 15$
B) $y = 12x + 15$
C) $y = -12x - 15$
D) $y = 12x - 15$
E) none of the above

9 Integrate

$$\int x \sin x \, dx$$

A) $-x \cos x + \sin x + C$
B) $x \cos x + \sin x + C$
C) $-x \sin x + \cos x + C$
D) $-x \cos x - \sin x + C$
E) none of the above

10 Simplify the expression
$\log_5 \sqrt{125} - 1\log_{25} 5$

A) 2
B) 1
C) 5
D) 25
E) None of the above.

A

11 At what values of t does the function $g(t) = 2t/(t^2+1)$ have extreme values?

A) absolute maximum at $t = 1$,
absolute minimum at $t = -1$,
no other local extrema.
B) absolute maximum at $t = 2$,
absolute minimum at $t = 0$,
no other local extrema.
C) no absolute or local extrema
D) absolute maximum at $t = 2$,
absolute minimum at $t = -2$,
no other local extrema.
E) none of the above

12 Express the rational number 3/11 as a repeating decimal. Use a bar to indicate the repeating digits.

A) $0.\overline{27}$
B) $0.\overline{29}$
C) $0.2\overline{8}$
D) $0.27\overline{3}$
E) none of the above

13 Given $z = f(x, y) = x^3y - e^{xy}$,
find $\frac{\partial y}{\partial y}$.

A) $x^3 - ye^{xy}$
B) $x^3y - xe^{xy}$
C) $x^3y - e^{xy}$
D) $x^3 - xe^{xy}$
E) none of the above

A

14 Calculate the third derivative of $f(x) = \sin^2 x$.

A) $-4 \sin x$
B) $-4 \sin(2x)$
C) $-2 \cos(2x)$
D) $-2 \sin(2x)$
E) none of the above

15 Evaluate

$$\lim_{x \to -\infty} \frac{-4x^3 + 7x}{2x^2 - 3x - 10}$$

A) 1
B) 0
C) ∞
D) $-\infty$
E) none of the above

16 Find the best linear approximation to the function $p(x) = -x^3 + 3x$ at the point (2, -2).

A) $L(x) = 16 - 9x$
B) $L(x) = 8x - 18$
C) $L(x) = 14 - 8x$
D) $L(x) = 9x - 20$
E) none of the above

17 For what value of the constant C is

$$f(x) = \begin{cases} x^2 - 10 & if\ x \neq 4 \\ C & if\ x = 4 \end{cases}$$

continuous everywhere?

A) 6
B) 12
C) 8
D) 4
E) none of the above

A

18 Evaluate the expression $\log_3(3^4) - \ln(e^{0.5})$

A) 3.5
B) 4.5
C) 2.2
D) 6.6
E) none of the above

19 Find the area of the finite region bounded by the graphs of the functions $f(x) = x$ and $g(x) = x^2$

A) 1/2 square units
B) 1/6 square units
C) 1/4 square units
D) 1/3 square units
E) none of the above

20 Find the volume of a solid generated when the region under the curve $y = \sin x$ and above the x-axis from $x = 0$ to $x = \pi$, is rotated about the x-axis.

A) $\pi^2/4$ cubic units
B) $\pi^2/3$ cubic units
C) $\pi^2/6$ cubic units
D) $\pi^2/2$ cubic units
E) none of the above

21 Find the point(s) on the curve $y = x^2$ such that the tangent lines to the curve at those points pass through (2, -12).

A) (6, 36) and (2, 4)
B) (-6, 36) and (-2, 4)
C) (-6, 6) and (-2, 4)
D) (6, 36) and (-2, 4)
E) none of the above

A

22 For what values of m is the line $3x + my = 6$ perpendicular to the line $6x + y = 2$?

A) $m = -12$
B) $m = 18$
C) $m = -16$
D) $m = -18$
E) none of the above

23 Find the absolute maximum and absolute minimum values of the function
$f(x) = x^2 + (16/x),\ 1 \le x \le 4$

A) maximum 20, minimum 12
B) maximum 20, minimum 17
C) maximum 20, minimum 16
D) maximum 24, minimum 17
E) none of the above

24 If f is one-to-one, and

if f(1) = 3, f(2) = 4, f(3) = 5,

f(4) = 8, and f(5) = 20,

find $f^{-1}\left(f^{-1}\left(f^{-1}(20)\right)\right)$

A) 2
B) 1
C) 8
D) 3
E) None of the above

A

25 Evaluate
$$\iiint_R (x^2 + yz)\,dV$$
where R is the rectangular box
$0 \le x \le 1,\quad 1 \le y \le 2,\quad 1 \le z \le 2$

A) 21/6
B) 31/12
C) 31/6
D) 33/12
E) none of the above

26 Evaluate

$$\lim_{x \to 1} \frac{\ln(x^3)}{x^2 - 1}$$

A) 1/2
B) 3/2
C) 2/3
D) 1/3
E) none of the above

27 Evaluate
$$\lim_{x \to 2} \frac{3}{x - 2}$$

A) ∞
B) 0
C) $-\infty$
D) 1
E) none of the above

A

28 Find all inflection points of the graph of $f(x) = 3x^5 - 5x^4 + 13x$.

A) (0,0) and (1, 11)
B) (-1, -21) and (1,11)
C) (1, 11) only
D) (0,0) only
E) none of the above

29 Find the limit of the sequence

$$\left\{\frac{2n}{n+3}\right\}$$

A) 2
B) 1
C) 0
D) 3
E) none of the above

30 What values of x satisfy the following inequality?

$$\frac{5}{1-x} < \frac{6}{1+x}$$

A) no values of x
B) $-1 < x < \frac{1}{11}$
C) $-1 < x < \frac{1}{11}$ *or* $x > 1$
D) $x > 1$
E) $x < -1$

31 If $\sin x = U$, express $\sin(3x)$ in terms of U.

A) $-3U + 4U^3$
B) $3U + 4U^3$
C) $4U - 3U^3$
D) $3U - 4U^3$
E) none of the above

A

32 What is the equation of the line through points $P(-1,2)$ and $P(-2,1)$?

A) $2y - x = 5$
B) $x + y = 3$
C) $y = x + 1$
D) $x - y + 3 = 0$
E) $y = x - 1$

33 Find an equation of the line tangent to the curve

$$y = \left(x^2 - 3\right)^8$$

at the point (2,1).

A) $32x - y - 63 = 0$
B) $32x + y - 65 = 0$
C) $32y + x - 34 = 0$
D) $32y - x - 30 = 0$
E) none of the above

34 A large number of tosses of a biased coin shows that the probability of its landing heads is 0.55 and the probability of its landing tails is 0.45. You are offered a chance to play a game in which you toss the coin and win \$10 if it comes up heads and \$15 if it comes up tails. How much should you be prepared to pay to play this game if you want the probability that you will not lose money to be at least 0.5?

A) \$12.25
B) \$12.15
C) \$12.35
D) \$12.50
E) none of the above

A

35 Find the roots of the polynomial

$$x^5 - 8x^3 + 16x.$$

Give the multiplicity of each.

A) Roots are; 0 with multiplicity 1, and 2 with multiplicity 4.
B) Roots are 2 and -2, each with multiplicity 2
C) Roots are; 0 (multiplicity 1), 2 (multiplicity 2), and -2 (multiplicity 2).
D) Roots are 0, 2, -2, 2i, -2i, each with multiplicity 1
E) none of the above

36 Solve the logarithmic equation

$$2\log_9(\sqrt{x}) - \log_9(6x-1) = 0.$$

A) 1/5
B) ½
C) 1/6
D) 1/10
E) none of the above

37 Find the line that passes through the point (0,1) and through the point of intersection of the two lines;
$x + 2y = 5$ and $2x + y = 4$.

A) $y = \frac{1}{2}x + 1$
B) $y = x + 1$
C) $3y = x + 3$
D) $y = 1 - x$
E) none of the above

A

38 Find the second derivative of the function $f(x) = x^3 \sin(2x)$.

A) $6x \sin(2x) + 12 x^2 \cos(2x) + 4 x^3 \sin(2x)$
B) $6x \sin(2x) + 12 x^2 \cos(2x) - 4 x^3 \sin(2x)$
C) $-6x \sin(2x) + 12 x^2 \cos(2x) + 4 x^3 \sin(2x)$
D) $-6x \sin(2x) + 8 x^2 \cos(2x) - 4 x^3 \sin(2x)$
E) none of the above

39 Evaluate

$$\lim_{x \to 0} \frac{\sqrt{x+3} - \sqrt{3}}{x}$$

A) $3/2\sqrt{3}$
B) $1/2\sqrt{3}$
C) $-1/2\sqrt{3}$
D) $1/3\sqrt{3}$
E) none of the above

40 Evaluate

$$\int_0^3 \frac{x^3}{\sqrt{25 - x^2}}\, dx$$

A) 14/3
B) 14/6
C) 11/6
D) 11/3
E) none of the above

41 Find two nonnegative numbers, whose sum is 9, such that the sum of one number and the square of the other number is a maximum.

A) 3 and 6
B) 1 and 8
C) 0 and 9
D) ½ and 17/2
E) none of the above

A

42 Find the points on the curve $y = x^4 - 6x^2 + 4$ where the tangent line is horizontal.

A) $(0,4), \left(\sqrt{3},-5\right)$ *and* $\left(-\sqrt{3},-5\right)$
B) $\left(\sqrt{3},-5\right)$ *and* $\left(-\sqrt{3},-5\right)$
C) $(0,4), \left(-\sqrt{3},5\right)$ *and* $\left(\sqrt{3},-5\right)$
D) $(0,4), \left(\sqrt{2},-5\right)$ *and* $\left(-\sqrt{3},-5\right)$
E) none of the above

43 Evaluate

$$\lim_{x\to\infty} \frac{x^3}{\sqrt{1+x^6}}$$

A) 0
B) -1
C) 1
D) ∞
E) none of the above

44 Evaluate the integral

$$\int_0^4 |x-1|\, dx$$

A) 7
B) 5
C) 4
D) 6
E) none of the above

A

45 Evaluate

$$\lim_{x\to 0^+} (1-3x)^{1/x}$$

A) - ln 3
B) -1/3
C) e^{-3}
D) -3
E) none of the above

46 Evaluate

$$\lim_{x\to 0^+} x \ln x$$

A) ∞
B) 1
C) 0
D) $-\infty$
E) none of the above

47 Evaluate the integral

$$\int \frac{3}{x \ln x}\, dx$$

A) $\ln(3|\ln x|) + C$
B) $3\ln|\ln x| + C$
C) $\ln|\ln x| + C$
D) $\dfrac{-3}{(\ln x)^2} + C$
E) none of the above

A

48 Evaluate the integral

$$\int \frac{x}{x+1}\,dx$$

A) $2x - \ln|x+1| + C$
B) $x + \ln|x-1| + C$
C) $2x + \ln|x+1| + C$
D) $x - \ln|x+1| + C$
E) none of the above

49 Evaluate the integral

$$\int \frac{x^2}{x+1}\,dx$$

A) $\frac{1}{2}x^2 + x + \ln|x+1| + C$
B) $\frac{1}{3}x^2 - x + \ln|x+1| + C$
C) $\frac{1}{2}x^2 - x - \ln|x+1| + C$
D) $\frac{1}{2}x^2 - x + \ln|x+1| + C$
E) none of the above

50 Find an equation for the line through P(2,3) that is perpendicular to the line $3x - y = 4$?

A) $x - 3y = -7$
B) $x + 3y = -7$
C) $3x + y = 9$
D) $3x - y = 3$
E) $x + 3y = 11$

TEST BİTTİ
CEVAPLARINIZI KONTROL EDİNİZ