

A

- 1 The planet Neptune is 4 496 000 000 kilometres from the Sun.
Write this distance in standard form.

- A) 44.96×10^8 km
B) 4.496×10^8 km
C) 4.496×10^9 km
D) 4.496×10^{10} km
E) 0.4496×10^{-10} km

- 2 In triangle ABC, AB = 6 cm, AC = 8 cm and BC = 12 cm. Angle ACB = 26.4° .
Calculate the area of the triangle ABC.

- A) 10.7 cm^2
B) 16 cm^2
C) 48 cm^2
D) 21.3 cm^2
E) 12.3 cm^2

- 3 The remainder when $(2x + 3)(4x^2 - 4x - 5)$ is divided by $2x - 3$ is

- A) 12
B) 0
C) 60
D) -12
E) 171

A

- 4 Solve the simultaneous equations
 $0.4x + 2y = 10$,
 $0.3x + 5y = 18$.
Find the value of $x+y$.

- A) 30
B) 7
C) 13
D) 8
E) 130

- 5 A regular polygon has each interior angle equal to 108° . How many sides has the polygon?

- A) 5
B) 8
C) 7
D) 6
E) 4

- 6 Sima drinks 2.5 litres of water each day.
A full glass holds 125 millilitres of water.
How many full glasses of water does Sima drink each day?

- A) 50
B) 40
C) 20
D) 60
E) 200

A

7 The curve with equation $y = 2x^3 - 3x^2 - 12x + 1$ has

- A) no stationary values
- B) exactly one stationary value
- C) a stationary value at $x = 1$
- D) a maximum at $x = 2$
- E) a maximum at $x = -1$

8 Write down the next prime number after 89.

- A) 91
- B) 97
- C) 90
- D) 93
- E) 98

9 Angharad had an operation costing \$500.

She was in hospital for x days.

The cost of nursing care was \$170 for each day she was in hospital.

The total cost of her operation and nursing care was \$2370.

Work out how many days Angharad was in hospital.

- A) 4.4
- B) 9
- C) 7
- D) 10
- E) 11

A

10 Equations of the tangent and normal at the origin to the circle

$$x^2 + y^2 - 2x + 3y = 0$$

are respectively

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

11 The roots of the equation $x^2 - 4x - 2 = 0$ are α and β . An equation whose roots are $\alpha + 3, \beta + 3$ is

- A) $x^2 + 10x - 19 = 0$
- B) $x^2 - 10x + 19 = 0$
- C) $x^2 - 12x + 18 = 0$
- D) $x^2 + 7x + 7 = 0$
- E) $x^2 + 2x - 5 = 0$

12 How many lines of symmetry has an equilateral triangle?

- A) 2
- B) 3
- C) 6
- D) 4
- E) 1

A

- 13 In 2004 Colin had a salary of \$7200.
This was an increase of 20% on his salary in 2002.
Calculate his salary in 2002.

- A) 5800
B) 8640
C) 8400
D) 6000
E) 9600

- 14 The distance between Singapore and Sydney is 6300 km correct to the nearest 100 km.
A businessman travelled from Singapore to Sydney and then back to Singapore.
He did this six times in a year.
What is the minimum total distance he travelled?

- A) 37500
B) 37800
C) 38100
D) 75000
E) 76200

- 15 Calculate the derivative of the given function at the point $x = 2$.

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

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

A

- 16 Use implicit differentiation to find $\frac{dy}{dx}$, if

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

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

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

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

- 18 Find the derivative of

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

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

A

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

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

20 Compute the integral

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

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

21 Simplify the expression

$$\log_5 \sqrt{125} - \log_{25} 5$$

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

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

- A) $0.2\bar{7}3$
- B) $0.\overline{27}$
- C) $0.\overline{29}$
- D) $0.2\bar{8}$
- E) none of the above

A

23 Evaluate the integral

$$\int \frac{x^3}{(1+x^4)^{1/3}} dx$$

- A) $-\frac{3}{8}(1+x^4)^{-2/3} + C$
- B) $-3(1+x^4)^{-4/3} + C$
- C) $\frac{3}{4}(1+x^4)^{1/3} + C$
- D) $\frac{3}{8}(1+x^4)^{2/3} + C$
- E) none of the above

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

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

25 Solve the inequality $x^3 < 9x$, giving the solution set as an interval or union of intervals.

- A) $(-\infty, -3)$
- B) $(-\infty, 3) \cup (3, 9)$
- C) $(\infty, 3)$
- D) $(-\infty, -3) \cup (0, 3)$
- E) none of the above

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26 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

27 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

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

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

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

30 Find the limit of the sequence

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

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

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

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

32 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

33 Evaluate

$$\iiint_R (x^2 + yz) dV$$

where R is the rectangular box
 $0 \leq x \leq 1, 1 \leq y \leq 2, 1 \leq z \leq 2$

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

A

34 Evaluate the integral

$$\int_C (x^2 + y^2) ds$$

once around the square C in the xy -plane
with vertices $(\pm 1, 1)$ and $(\pm 1, -1)$.

- A) 11
- B) $16\sqrt{3}$
- C) 8
- D) $32\sqrt{3}$
- E) none of the above

35 Given that

$$\int_1^2 f(x) dx = 2 \text{ and } \int_1^4 f(x) dx = -1.$$

$$\text{Find } \int_2^4 f(x) dx.$$

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

36 Find the absolute maximum and absolute minimum values of the function

$$f(x) = x^2 + (16/x), \quad 1 \leq x \leq 4$$

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

A

37 Evaluate

$$\lim_{x \rightarrow 2} \frac{3}{x-2}$$

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

38 Find the area of the finite region bounded by the graphs of the functions

$$f(x) = x \text{ and } g(x) = x^2$$

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

39 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) \$12.50
- B) \$12.25
- C) \$12.15
- D) \$12.35
- E) none of the above

A

40 Evaluate the integral

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

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

41 Solve the logarithmic equation

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

- A) $1/6$
B) $1/10$
C) $1/5$
D) $1/2$
E) none of the above

42 Evaluate the integral

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

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

A

43 Evaluate

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

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

44 Evaluate

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

- A) $14\sqrt{6}$
B) $11\sqrt{6}$
C) $11\sqrt{3}$
D) $14\sqrt{3}$
E) none of the above

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

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

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

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

A

47 Solve the exponential equation
 $2^x 3^{(x+1)} = 108$.

- A) $x = 2$
- B) $x = -1$
- C) $x = 1$
- D) $x = -2$
- E) none of the above

48 Evaluate

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

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

49 Evaluate the integral

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

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

A

50 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) 1 and 8
- B) 0 and 9
- C) 3 and 6
- D) $\frac{1}{2}$ and $17/2$
- E) none of the above

TEST BİTTİ
CEVAPLARINIZI KONTROL EDİNİZ

B

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