GRADE- 11

MATHEMATICS

FINAL EXAM

100 MARKS

Chapter(1)

1.(x-2) is a factor of $x^{n+1} + 5x^n - 10x - 36. Then\ n =$

A.2 B.4. C.3 D.5

2.When $(2x + k)^{2024} + (x - 1)^2$ is divided by (1+x),the remainder is 5.Then k =

A.3 B.-3

C.3 or 1 D.3 or -1

3.If f(x)=$x^7 - 97x^6 - 199x^5 + 99x^4 - 2x + 199$ is divided by (x-99),then the remainder is

A.16 B.10 C.-2 D.1

4.The remainder when $5x^4 - 3x^2 + 4$ is divided by $x^2 + 2\ is$

A.30 B.-30 C.20 D.-20

5. Given that $2x^3 + ax^2 + bx + c$

leave the same remainder when divided by x-2 or x- 1.Find 3a+b+14(3-marks)

$\boxed{3a+b+14}$ =0

***Chapter*(2)**

6. In the expansion of $(2a^2 - 3a^3)^n$ if the fifth term does not contain a factor of a,what is the value of n.

A.11 B.10 C.9 D.6

7. ${}^nC_0 + {}^nC_2 + {}^nC_4 + \ldots$ is

A.n^2 B.2^n C.2^{n+1} D.2^{n-1}

8. Find the last two digits of 3^{10} *is*

A.49 B.50 C.51 D.9

9. The number of terms in the expansion of $(1 - 2x + x^2)^{50}$ *is*

A.51 B.52 C.100 D.101

10. Given that $\left(p - \frac{1}{2}x\right)^6 = r - 96x + sx^2 + \cdots$.Find p , r and s.(3-marks)

p= A.2 B.-2 C.3 D.-3

r= A.32 B.64 C.243 D.729

s= A.15 B.30 C.45 D.60

Chapter(3)

11. Given that f(x)=x^2,stretched by a factor of 2 , shifted vertically 3 units downward.The resulting function is

A.$\frac{1}{2}x^2 - 3$ B.$2x^2 - 3$ ✓

C.$\frac{1}{2}x^2 + 3$ D.$2x^2 + 3$

12.The graph of an even function is symmetric with respect to

A. X-axis B.origin

C.Y-axis✓ D.neither

13. The graph of y=f(x) move nearer horizontally by scale factor $\frac{1}{q}$ to the Y-axis , when q is

A. $0 < q < 1$ B. $q > 1$ ✓

C. $q < 1$ D. $q = 1$

14. A point p is reflected in the origin.Coordinates of its images are (-2,5), then p is

✓A.(2,-5) B.(-2,-5) C.(-2,5) D.(2,5)

$Chapter(3)$

(15) *The transformation function*, $f(x) = -2(\frac{1}{3}x - 1)^3 + 2$, *answer the following questions.* (5 *marks*)

(i) *Which of the following is the parent function for* $f(x)$?

A. $y = x$ B. $y = x^3$ C. $y = |x|$ D. $y = \sqrt{x}$

(ii). *Write a description for the two translations.*

A. *translation 1 unit to the right and 2 units up*

B. *translation 1 unit to the right and 2 units down*

C. *translation 1 unit to the left and 2 units up*

D. *translation 1 unit to the left and 2 units down*

(iii) *If the point* $A(0,0)$ *is on the original graph, then the respective point on the graph of*

$$y = -2(\frac{1}{3}x - 1)^3 + 2 \text{ is}$$

A. $(-2,0)$ B. $(3,2)$ C. $(-1,0)$ D. $(3,-2)$

(iii) *If the point* $A(2,8)$ *is on the original graph, then the respective point on the graph of*

$$y = -2(\frac{1}{3}x - 1)^3 + 2 \text{ is}$$

A. $(-9,14)$ B. $(9,16)$ C. $(9,-14)$ D. $(9,-16)$

(iii) *If the point* $A(-2,-8)$ *is on the original graph, then the respective point on the graph of*

$$y = -2(\frac{1}{3}x - 1)^3 + 2 \text{ is}$$

A. $(-3,18)$ B. $(3,16)$ C. $(3,-18)$ D. $(3,-16)$

$\boldsymbol{Chapter(4)}$

16. The smallest positive number in an AP 179,173,167,…

is A.2 B.3 C.4 D.5

17. The product of 5 consecutive terms of a GP is 243 ,then the middle term is

A.9 B.4 C.5 D.3

18. The sum to infinity of $1+1+\frac{1}{2}+\frac{1}{4}+\cdots$ *is*

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

19. $(n-2)^{th}$ term of an AP is (n+2).Then $(n+2)^{th}$ term is

A.n+4 B.n-4 C.n+6 D.n-6

20. Find the sum of the first n natural numbers.(3-marks)

a= A.0 B.1 C.2 D.-1

d= A.1 B.2 C.3 D.-1

S_n=

A.$\frac{1}{2}n$ B.2n

C.n^2 D.$\frac{1}{2}(n^2+n)$

21. If C=$\begin{bmatrix}1 & -2 & 0\\3 & 4 & -1\end{bmatrix}$, then which of the following is(are) true?

(1) C_{21}=3 (2) $C_{11} + C_{23} = C_{13}$ (3) $C_{22} – C_{12}$=2

A.1 only B.2 only

C.1 and 2 only D.1,2,3

22. If $\begin{bmatrix}b & 2-c\\4-d & a\end{bmatrix} = \begin{bmatrix}3-a & b\\c & 5-d\end{bmatrix}$,then **a + b + c + d=**

A.4 B.5 C.6 D.7

23. Given that $\begin{bmatrix}2 & 1\\0 & 1\end{bmatrix}\begin{bmatrix}x\\y\end{bmatrix} = \begin{bmatrix}5\\2\end{bmatrix}$, then$\begin{bmatrix}1 & 2\\0 & 1\end{bmatrix}\begin{bmatrix}x\\y\end{bmatrix} =$

A.$\begin{bmatrix}0\\-1\end{bmatrix}$ B.$\begin{bmatrix}4\\1\end{bmatrix}$ C.$\begin{bmatrix}\frac{11}{2}\\2\end{bmatrix}$ D.$\begin{bmatrix}16\\9\end{bmatrix}$

24. If Q=$\begin{bmatrix}3 & 7\\2 & 5\end{bmatrix}$,then $(Q^{-1})^T$ =

A.$\begin{bmatrix}5 & 2\\7 & 3\end{bmatrix}$ B.$\begin{bmatrix}3 & -2\\-1 & 1\end{bmatrix}$ C.$\begin{bmatrix}3 & -1\\-2 & 1\end{bmatrix}$ D.$\begin{bmatrix}5 & -2\\-7 & 3\end{bmatrix}$

25. Given that A=$\begin{bmatrix}1 & 0\\3 & 4\end{bmatrix}$ and A-kI is singular then k=

A.-1 or 4 B.1 or -4

C.1 or 4 D.-1 or -4

26. P=$\begin{pmatrix}a & b\\c & d\end{pmatrix}$, det P=14,ac=8 and bd=15.Then

Q=$\begin{pmatrix}a^{-1} & b^{-1}\\c^{-1} & d^{-1}\end{pmatrix}$.Find det Q.(3-marks)

det P= A.ab-cd B.ab+cd

C.ad-bc D.ad+bc

det Q=

A.$a^{-1}b^{-1} - c^{-1}d^{-1}$ B.$a^{-1}b^{-1} + c^{-1}d^{-1}$

C.$a^{-1}d^{-1} - b^{-1}c^{-1}$ D.$a^{-1}d^{-1} + b^{-1}c^{-1}$

detQ =

A.$-\frac{7}{60}$ B.$\frac{7}{60}$ C. -120 D. 112

Chapter(6)

27. If the mean of 26,19,15,24 and x is x ,then the median of the data is

A.19 B.20 C.21 D.22

28. Since the value of correlation coefficient is zero,

1.there is no relationship

2.there is no linear relationship

3.there is strong positive linear relationship

A.1-only B.1 and 2-only C.2-only D.3-only

29. The class mark of a class is 25 and if the upper limit of that class is 40,then it's lower limit is

A.15 B.20 C.10 D.5

30. If the variance of the data is 12.25,then the standard deviation is

A.3.5 B.3.25 C.3 D.2.5

31. The variance of 10,10,10,10,10 is

A.0 B.5 C.10 D.$\sqrt{10}$

32. Consider the frequency of five observations x-2,x-4,y,-2x,x.If the cumulative frequency of fifth observation is 9,find the value of y and express the equation of regression line.(3-marks)

Cumulative frequency of fifth is

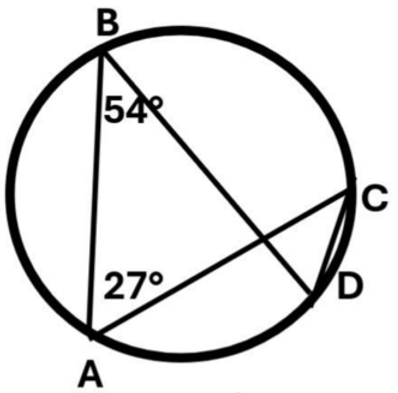
A.x B.-3x C.-x+y D.x-6+y

y= A.9 B.-27-x C.15-x D.9-x

The equation of regression line is

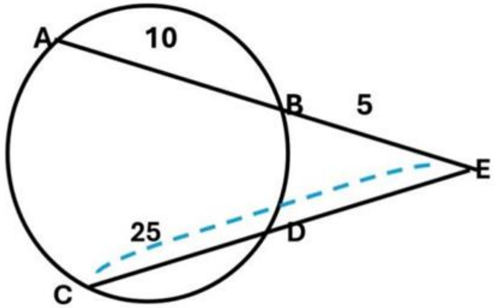
A.y=ax+b B.y=a+bx C.y=ax-b D.y=a-bx

33. A,B,C,D are points on the circumference of a circle.If $\angle BAC = 27°$ and $\angle ABD = 54°$, then $\angle ACD$=



A.27° B.54° ✓ C.60° D.90°

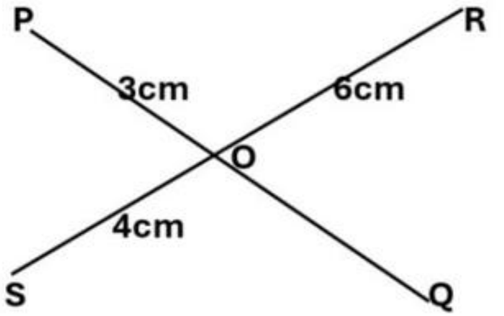
34. In the diagram if AB=10cm , BE=5cm and CE=25cm ,then DE=



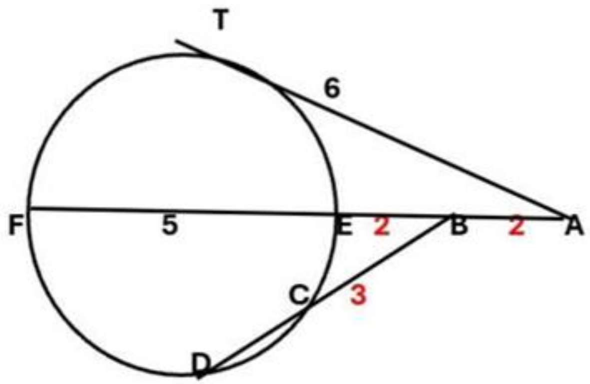
A.2cm B.3cm ✓ C.5cm D.7cm

35. The points P,Q,R and S will be concyclic if OQ=

A.8cm ✓ B.6cm C.4cm D.2cm



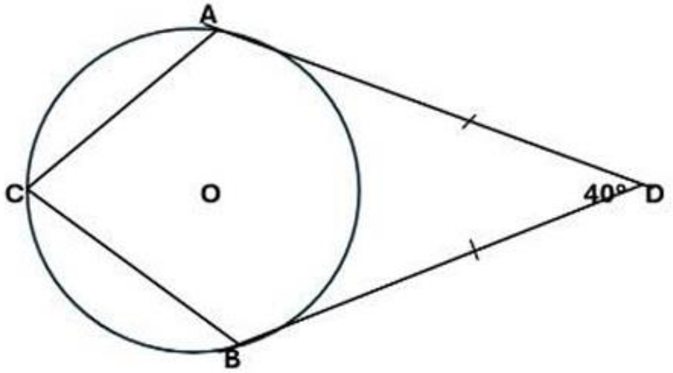
36. In the figure CD=



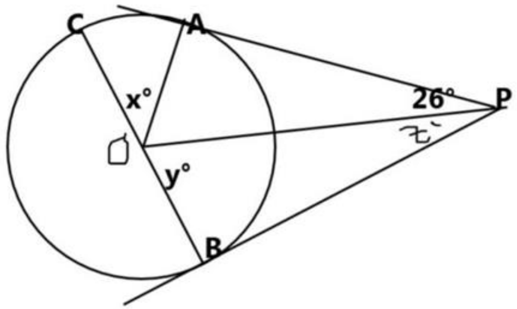
A.1.67 ✓ B.4.13 C.2.51 D.4.12.

37. In the figure, DA and DB are tangents to the circle whose centre is O and DA= DB. If *L*ADB=40° then *L*ACB is

A.140° B.70° C.35° D.55°



38. In the figure,PA and PB are tangent to circle O.Find the values of x,y and z.(3-marks)



PA and PB are tangents.

Z=

A.90° B.52° C.26° D.13°

*L*AOP=*LBOP*(OP bisects *L*AOB)

*L*AOP=y

In ΔOAP,*L*AOP+*L*OPA+*L*OAP=180°

y=

A.26° B.64° C.45° D.52°

BOC is a straight line.

x=

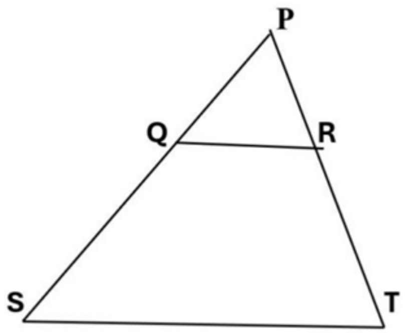
A.64° B.45° C.26° D.52°

$Chapter(8)$

39. The area of two similar triangles are in the ratio 4:9.One side of smaller triangle is 4.The corresponding side of the other triangle is

A.9 B.8 C.6 D.3

40. In the diagram,QR//ST .If $\frac{\alpha(\Delta PQR)}{\alpha(\Delta PST)} = \frac{9}{64}$,then PQ:QS=



A.3:8 B.3:5 C.5:3 D 2:5

41. Two chords of a circle PQ and RS intersect at O, $\alpha(\Delta POR):\alpha(\Delta SOQ) =$

A.$OP^2 : OS^2$ B.$PO^2 : OQ^2$

C.$OQ^2 : PR^2$ D.$OP^2 : OR^2$

42. In the trapezium PQRS, PQ//SR and SR= 2PQ.PR and QS intersect at O.Given that $\alpha(\Delta POQ) = 5\text{cm}^2$ $then\ \alpha(\Delta SOR) =$

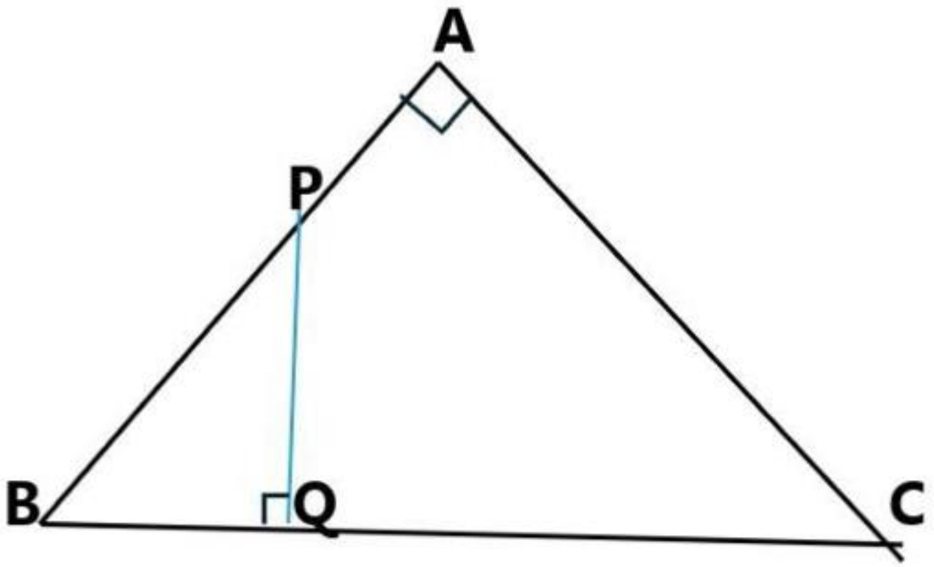
A.$10cm^2$ B.$15cm^2$

C.$20cm^2$ D.$25cm^2$

43. The area of two similar triangles are in the ratio 4:9.One side of the smaller triangle is a-cm.The corresponding side of the other triangle is

A.2a B.$\frac{3a}{2}$ C.3a. D.$\frac{2a}{3}$

44. In $\Delta ABC, \angle A=90°, PQ \perp BC$, if $AC=3, BC=5$ and $CQ=3$, find $\alpha(\Delta BPQ):\alpha(APQC)$ $[3-marks]$



In $\Delta ABC, \angle A=90°$

AB=

A.3 B.4 C.5 D.6

$\Delta BPQ \sim \Delta BCA$ (AA corollary)

$$\frac{\alpha(\Delta BPQ)}{\alpha(\Delta BCA)} =$$

A.$\frac{1}{2}$ B.$\frac{1}{3}$ C.$\frac{1}{4}$ D.$\frac{1}{6}$

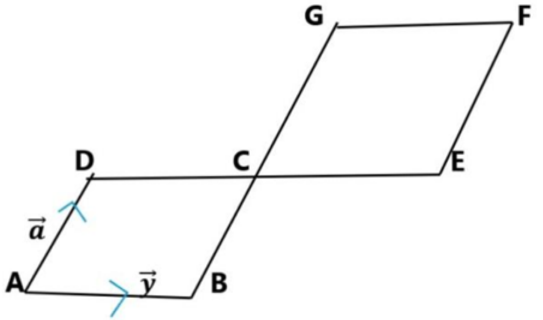
$$\frac{\alpha(\Delta BPQ)}{\alpha\Delta(APQC)} =$$

A.1:2 B.1:3 C.1:4 D.1:6

45. Parallelogram ABCD is translated to the position CEFG so that DCE and BCG are straight lines. If $\overrightarrow{AD} = \vec{a}$, $\overrightarrow{AB} = \vec{y}$, then $\overrightarrow{GD} =$

A. $\vec{a} + 2\vec{y}$ B. $\vec{a} + \vec{y}$

C. $-\vec{a} - \vec{y}$ ✓ D. $\vec{a} + 3\,\vec{b}$



46. If $\overrightarrow{AB} = -3\overrightarrow{(BC)}$, which of the following is(are) true?

1. AB= -3BC 2. A,B,C are collinear 3. C lies between A and B

A. 1 only B. 2 only C 3 only ✓ D. 2 and 3 only

47. Given that $\vec{a} = 3\,\hat{\imath} + 4\,\hat{\jmath}$. Then the vector with magnitude 20 units and in the direction of $\vec{a}$ *is*

A. $12\,\hat{\imath} + 6\hat{\jmath}$ B. $60\hat{\imath} + 120\,\hat{\jmath}$

C. $12\,\hat{\imath} + 16\hat{\jmath}$ ✓ D. . $-12\hat{\imath} - 16\,\hat{\jmath}$

48. P=(3,4), R=(8,2) and O is the origin. If $\overrightarrow{OT} = \overrightarrow{OP} + \frac{1}{2}\,\overrightarrow{OR},\ then\ T =$

A. (11,6) B. (5,-2) C. 5,7)

D. (7,5) ✓

49. If the vector $\binom{x}{y} - \binom{3}{5}$ *is parallel to* $\binom{3}{1}$ *then*

A. 3x-y=12 B. 3x+y=12

C. 3y-x=12 ✓ D. 3y+x=12

50. The position vectors of A, B and C are $2\vec{p} - \vec{q}$, $k\vec{p} + \vec{q}$ and $12\vec{p} + 4\vec{q}$ respectively.
Calculate the value of k if A , B and C are collinear.(3- marks)

Solution

Let O be the origin,

$\overrightarrow{OA} = 2\vec{p} - \vec{q}$, $\overrightarrow{OB} = k\vec{p} + \vec{q}$, $\overrightarrow{OC} = 12\vec{p} + 4\vec{q}$

$\overrightarrow{AB} = \overrightarrow{(OB)} - \overrightarrow{OA}$

A. $(k-2)\vec{p} + 2\vec{q}$ ✓ B. $(k+2)\vec{p} + 2\vec{q}$

C. $(k-2)\vec{p} - 2\vec{q}$ D. $(k+2)\vec{p} - 2\vec{q}$

$\overrightarrow{AC} = \overrightarrow{OC} - \overrightarrow{OA}$

A. $10\vec{p} - 5\vec{q}$ B. $10\vec{p} + 5\vec{q}$ ✓

C. $-10\vec{p} + 5\vec{q}$ D. $-10\vec{p} - 5\vec{q}$

If A ,B and C are collinear ,

$\overrightarrow{AB} = h\,\overrightarrow{AC}$

$(k-2)\vec{p} + 2\vec{q} = 10h\,\vec{p} + 5h\,\vec{q}$

k-2= 10h and. 2=5h

k=?

A.2 B.5 C.6 ✓ D.10

$Chapter(9)$

(2) The vectors $\overrightarrow{OP}$ has magnitude of 39 units and has the same direction as $\begin{bmatrix}5\\12\end{bmatrix}$.

(5 marks)

The vectors $\overrightarrow{OQ}$ has magnitude of 25 units and has the same direction as $\begin{bmatrix}3\\4\end{bmatrix}$.

Express the vector $\overrightarrow{OP}$ and $\overrightarrow{OQ}$ as column vectors and find the unit vector of $\overrightarrow{PQ}$.

(i) $\hat{p} =$ A. $\frac{1}{13}\begin{bmatrix}-5\\12\end{bmatrix}$ B. $\frac{1}{13}\begin{bmatrix}5\\12\end{bmatrix}$ C. $\frac{1}{13}\begin{bmatrix}-5\\-12\end{bmatrix}$ D. $\frac{1}{13}\begin{bmatrix}5\\-12\end{bmatrix}$

(ii) $\overrightarrow{OP} =$ A. $\begin{bmatrix}15\\36\end{bmatrix}$ B. $\begin{bmatrix}-15\\36\end{bmatrix}$ C. $\begin{bmatrix}-5\\-36\end{bmatrix}$ D. $\begin{bmatrix}15\\-36\end{bmatrix}$

(iii) $\hat{q} =$ A. $-\frac{1}{5}\begin{bmatrix}3\\4\end{bmatrix}$ B. $\frac{1}{5}\begin{bmatrix}-3\\4\end{bmatrix}$ C. $\frac{1}{5}\begin{bmatrix}3\\4\end{bmatrix}$ D. $\frac{1}{5}\begin{bmatrix}3\\-4\end{bmatrix}$

(iv) $\overrightarrow{OQ} =$ A. $\begin{bmatrix}-15\\20\end{bmatrix}$ B. $\begin{bmatrix}-15\\-20\end{bmatrix}$ C. $\begin{bmatrix}15\\20\end{bmatrix}$ D. $\begin{bmatrix}15\\-20\end{bmatrix}$

(v) the unit vector of $\overrightarrow{PQ} =$ A. $\begin{bmatrix}0\\1\end{bmatrix}$ B. $\begin{bmatrix}-1\\0\end{bmatrix}$ C. $\begin{bmatrix}1\\0\end{bmatrix}$ D. $\begin{bmatrix}0\\-1\end{bmatrix}$

Chapter(10)

52. In ΔABC, $a : b : c = 1 : 3 : \sqrt{7}$ then $\angle C =$

A. 30° B. 45° C. 60° D. 90°

53. cos 4A – cos 6A=

A. cos 2A B. 2sin A sin 5A

C. -2sin A sin 5A D. 2 cos A cos 5A

54. sin(-90°). + tan 45° + 2 sin 30° =

A. 0 B. 2 C. -1 D. 1

55. cos (30°+x) – sin (60° - x)=

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

56. csc A cannot be

A. -50 B. 4 C. 0 D. 1

57. Which of the following is(are) false?

1. sin 70° = cos 20° 2. tan 45° = cot 45°

3. sec A = csc (90° - A)

A. 1 only B. 2 only

C. 3 only D. 1 and 3 only

58. Solve the ΔABC with a=2 , c=$\sqrt{6}$ and $\angle C$ =60° ,

having given that sin75°=$\frac{\sqrt{6}+\sqrt{2}}{4}$. $(3 - marks)$

Solution

$\angle A$= A. 30° B. 45° C. 60. D. 90°

$\angle B$=

A. 55° B. 65° C. 75° D. 85°

b=

A. $\sqrt{3}-1$ B. $-\sqrt{3}-1$ C. $\sqrt{3}$ D. $\sqrt{3}+1$

59. .Solve ΔABC with $a = \frac{1}{\sqrt{6}-\sqrt{2}}$, $b = \frac{1}{\sqrt{6}+\sqrt{2}}$, $\angle C = 60°$.

Solution

By the law of Cosines, $c^2 =$

A. $a^2 + b^2 - 2ab\cos C$ ✓   B. $a^2 - b^2 + 2ab\cos C$

C. $a^2 - b^2 - 2ab\cos C$ D. $-a^2 - b^2 + 2ab\cos C$

The value of c , c=

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

By the law of Sines,

Sin A=

$A. c^2 \sin C$ $B. a^2 \sin C$ $C.\frac{c \sin C}{a}$ $D.\frac{a \sin C}{c}$ ✓

The value of $\angle A$, $\angle A$=

A. 30°   B. 45°   C. 75° ✓   D. 60°

The value of $\angle B$, $\angle B$=

A.75°   B.30°   C.45° ✓   D.60°

$Chapter (11)$

60. If $f(x)=\frac{1}{x^3+1}$, $then\ f'(1) =$

A. $\frac{1}{2}$ B. $-\frac{1}{2}$ C. -1 D. $-\frac{3}{4}$ ✓

61. $\lim_{x\to\infty}(2x^5+3x^2-2)$

A. ∞ ✓ B. $-\infty$ C. 0 D. 1

62. If $g(x)=\sqrt{x+2}$, g is continuous on its domain of

A. $(-2,\infty)$ B. $[-2,-\infty)$ C. $(-2,\infty)$ D. $[-2,\infty)$ ✓

63. Given that the gradient of the curve $y=x^2+ax+b$ at the point (2,-1) is 1.

Find the values of a and b.(3-marks)

$y=x^2+ax+b$ $\frac{dy}{dx} =$

A. $2x+a$ ✓ B. $2x+a+b$ C. $2+a$ D. $2x^2+a$

a=

A.3 B.-3 ✓ C.4 D.-4

b=

A.3 B.2 C.1 ✓ D.0

$Chapter(11)$

64. Find the equation of the tangent line and normal line to the curve $x^2 - y^2 = 25$ at the point (1,3).

Solution

$x^2 - y^2 = 25$, then $\frac{dy}{dx} =$

A. $\frac{x}{y}$ B. xy C. $\sqrt{x^2 - 25}$ D. $25 + x^2$

The slope of the tangent line at the point (1,3) is

m=

A. 3 B. 1 C. -1 D. $\frac{1}{3}$

The equation of the tangent line at the point (1,3) is

3y =

A. x+9 B. x+8 C. x+2 D. x-2

The slope of the normal line is

m=

A. -2 B. 2 C. 1 D. -3

The equation of the normal line at the point (1,3) is

y=

$A. -x - 4$ $B. x - 4$ $C. -3x + 6$ $D. -x + 4$

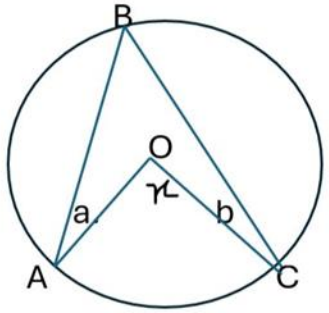
65.The opposite angles of a cyclic quadrilateral are in the ratio 3:7 . The difference of their degree measure is

A.90°　　B.72°　　C.40°　　D.30°

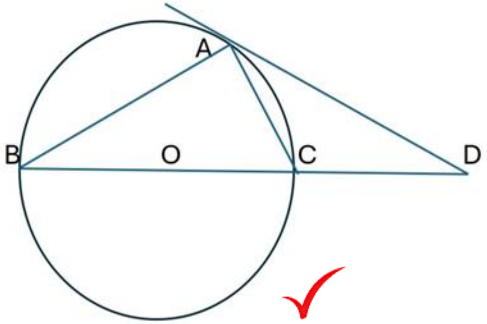
66.In the figure,O is centre of the circle , x=

A.2a+2b　　B.180°−2a

C.2a−2b　　D.a+b



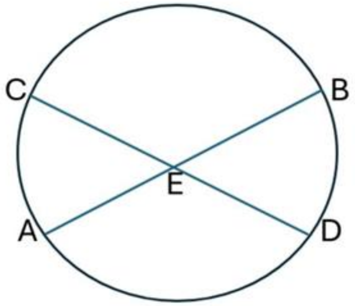
67.In circle O,AD=6 , AB=4 and AC=3,then CD=



A.6　　B.5　　C.4　　D.3

68.In the figure CE=6,CD=24 and AE=4EB,AB=

$\boldsymbol{A.\ 3\sqrt{3}}$　　$\boldsymbol{B.\ 10\sqrt{3}}$　　$\boldsymbol{C.\ 12\sqrt{3}}$　　$\boldsymbol{D.\ 15\sqrt{3}}$



69.Given that ΔABC ~ ΔPQR,

$\boldsymbol{\alpha(\Delta ABC):\alpha(\Delta PQR) = 25:9}$,

AB and PQ are corresponding sides and

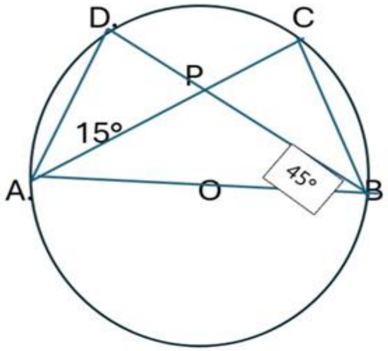
AB-PQ =6cm.Then PQ=

A.4　　B.6　　C.9　　D.12

70.Sum and difference of areas of two similar triangles are 234 and 90.The ratio of corresponding sides is

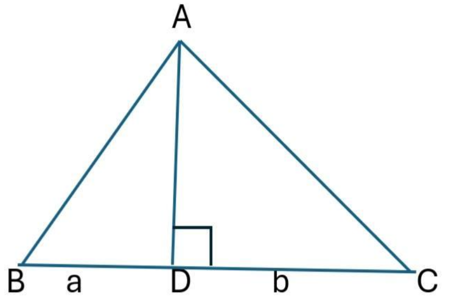
A.2:3　　B.3:5　　C.4:5　　D.5:8

71.In circle O,AB is a diameter, $\angle DAC=15°$ and $\angle ABD=45°$ then $\alpha(\Delta APD):\alpha(\Delta BPC) =$



A.2:1 B.3:1 C.3:2 D.9:1

72.In the figure,AD is perpendicular to BC ,$\alpha(\Delta ABD):\alpha(\Delta ACD) =$



A.$a^2:b^2$ B.$b^2:a^2$ C.b:a D.a:b

73.$\overrightarrow{AB} - \overrightarrow{CB} =$

$A.\overrightarrow{AB}$ $B.\overrightarrow{AC}$ $C.\overrightarrow{BC}$ $D.\overrightarrow{CA}$

74.$\vec{a}$ *and* $\vec{b}$ are non zero and non parallel vectors.

If $3\vec{a} + x\left(\vec{b} - \vec{a}\right) = y\left(2\vec{a} + \vec{b}\right)$. *Then* $2x + 3y =$

A.2 B.3 C.5 D.7

75.If P=(-1 ,1) and Q=(1,- 1),then the length of $\overrightarrow{PQ}$ *is*

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

76.If $\vec{p} = 8\hat{\imath} + 7\hat{\jmath}, \vec{q} = -3\hat{\imath} + 5\hat{\jmath}$, *then* $|\vec{p} + \vec{q}| =$

A.16 B.15 C.14 D.13

77.If $\overrightarrow{AB}$ *is* a unit vector ,then $|\overrightarrow{AB}| =$

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

78. If sin 20°=x ,then sec 290°=

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

79.Given that $sin\,\alpha = \frac{1}{2}$ $and\ cos\,\beta = \frac{1}{2}$,

$then\ the\ value\ of\ (\alpha + \beta) =$

A.0° B.30° C.60° D.90°

80.∆ABC is right angle at C,the value of cos(A+B) is

A.0 B.1 C.$\frac{1}{2}$ D.$\sqrt{3}$

81.If $cotx = \sqrt{3}, then\ tan(180° - x) =$

$A. \frac{1}{\sqrt{3}}$ $B. -\frac{1}{\sqrt{3}}$ $C. -\sqrt{3}$ $D. \sqrt{3}$

82.In ∆ABC,$\alpha : \beta : \gamma = 3:4:5, then\ a : b =$

A.2$:\sqrt{3}$ B.1$:\sqrt{3}$

C.1$:\sqrt{2}$ D.2$:\sqrt{6}$

83. $\lim_{x \to -3} \left(\frac{x^3 - 3^3}{x - 3}\right) =$

A.27 B.-27 C.9 D.-9

84.If $f(x) = \frac{\sqrt{x}}{2x}, then\ f'(1) =$

A.1 B.$\frac{1}{2}$ C.-1 D.$-\frac{1}{4}$

85.The value of x at which f is not continuous $f(x) = \frac{x^2 - 9}{|x-3|}$ is

A.-3 B.3 C.∞ D.9

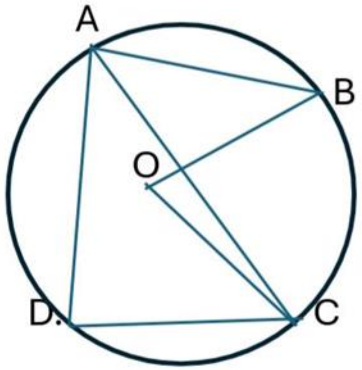
86.One sided limit of $\lim_{x \to 2^+} \left(\frac{x}{x^2 - 2x}\right)$ is

A.2 B.-2 C.∞ D.- ∞

87.If xy = 2 ,$\frac{dy}{dx} =$

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

88.In circle O,the circle through A,B,C,D. ∠BOC=100° and ∠OBA=62°.Calculate ∠BAC, ∠OCB and ∠ADC.



∠BAC=

A.30° **B.40°**

✓ **C.50°** **D.60°**

∠OCB=

A.30° **B.40°**✓

C.50° **D.60°**

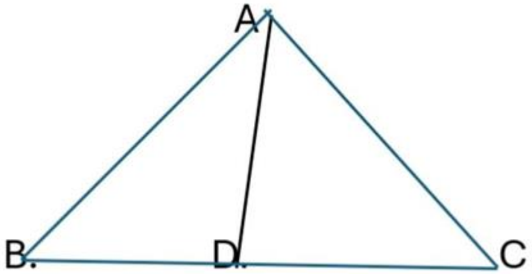
∠ADC=

A.68° **B.78°**✓

C.58° **D.88°**

89.In ΔABC,BD=3,DC=4 and $\alpha\ (\Delta ABD) = 5$.

Find $\alpha\ (\Delta ABC)$ and $\alpha\ (\Delta ADC)$.



$\boldsymbol{\alpha\ (\Delta ABD) : \alpha\ (\Delta ABC) =}$

$\boldsymbol{A.\frac{3}{4}}$ ✓ $\boldsymbol{B.\frac{3}{7}}$ $\boldsymbol{C.\frac{4}{3}}$ $\boldsymbol{D.\frac{9}{16}}$

$\boldsymbol{\alpha\ (\Delta ABC) =}$

A.7 **B.4** **C.3** **D.11.67** ✓

$\boldsymbol{\alpha(\Delta ADC) =}$

A.3 **B.4** **C.3.43** **D.6.67**✓

90.Relative to an origin O,the position vector of the points A,B,C are $\binom{2}{1}$, $\binom{1}{3}$ *and* $\binom{8}{9}$ *respectively*.

If $m\vec{a}+n\vec{b}=\vec{c}$,find the value of m,n and $\overrightarrow{AC}$.

Solution

m =

A.1 B.2 C.3 D.4

n =

A.1 B.2 C.3 D.4

$\overrightarrow{AC}=$

A.(6,8) B.(-6,-8)

C.(7,6) D.(-7,-6)

91.In a triangle,$2\,sin^2\,\alpha-cos^2\alpha\;=2, find\;\alpha$.

Solution

$(cos^2\,\alpha\,)=$

A.$1+sin\alpha$ C.$1+(sin^2\,\alpha\,)$

B.$1-sin\alpha$ D.$1-(sin^2\,\alpha\,)$

$sin\alpha=$

A.1 B.-1 C.±1 D.0

$\alpha=$

A.270° B.90° C.60° D.0°

92.If y=x²+2x+3 ,find $(y')^2+(y'')^3$

Solution

$y'=$

A.2x+2 B.2x-2

C.2x+2+3 D.2x-2+3

$y''=$

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

$(y')^2+(y'')^3=$

A.y B.2y C.3y D.4y

93.Given that $\vec{a} = \begin{pmatrix} p \\ 3 \end{pmatrix}$ $and\ \vec{b} = \begin{pmatrix} 7 \\ 9 \end{pmatrix}$,find the value(s) of p if (i) $\vec{a}\ is\ parallel\ to\ \vec{b}$ $(ii)\vec{a}\ and\ \vec{b}\ are\ same\ magnitude$.

Solution

$\vec{a}\ is\ parallel\ to\ \vec{b}$

$\vec{a} =$ $\quad A.\vec{b}$ $\quad B.-\vec{b}$ $\quad C.k\vec{b}$ $\quad D.-k\vec{b}$

p=

A.7 **B.3** **C.**$\frac{3}{7}$ **D.**$\frac{7}{3}$

k=

A.1 **B.**$\frac{1}{3}$

C.3 **D.**$-\frac{1}{3}$

$\vec{a}\ and\ \vec{b}\ are\ same\ magnitude$

A.$|\vec{a}| = |\vec{b}|$ **B.**$\vec{a} = \vec{b}$

C. $|\vec{a}| = -|\vec{b}|$ **D.** $\vec{a} = \vec{b}$

p=

A.11 **B.-11** **C.±11** **D.0**

94.Solve the triangle ABC with $\gamma = 60°, a = 5, b = 8$.

And then find the area of ΔABC.

Solution

c=

A.±7 **B.7** **C ±10** **D.10**

$\alpha =$

A.$38°12'$ B. $48°12'$

C. $58°12'$ D. $68°12'$

$\beta =$

A.$71°48'$ B. $81°48'$

C. $61°48'$ D. $51°48'$

S=

A=11.5 B.10.5

C.20 D.10

Area of ΔABC=

A.15.3 B.16.3

C.17.3 D.18.3

95.Find the coordinate of the points on the curve $x^2+y^2=32$ at which the tangent is perpendicular to the line x+y=1.

$y' =$ $A. -\frac{x}{y}$ $B. \frac{x}{y}$ $C. 2x$ $D. -2x$

x=

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

y=

A.4 B.-4 C.±4 D.±2

x = A.4 B.-4 C.±4 D.±2

Coordinates of the points are

A.(-4,4) and (4,4) B.(-4,-4) and (4,4)

C.(4,-4) and (-4,4) D.(2,-2) and (-2,2)