WEFI -SSF
SSLC - EXCELLENCY TEST - 2021

MATHEMATICS
(ENGLISH)

Time : 2 1/2 Hours **Total Score : 80**

Instructions :

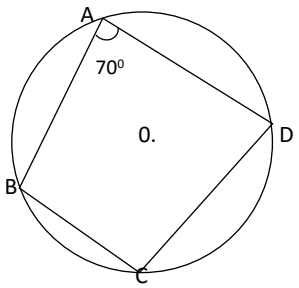
- First 20 minutes is the cool - off time. You may use the time to read the questions and plan your answers.
- Attempt the questions according to the instructions.
- Keep in mind the score and the time while answering the questions.
- The Maximum score for questions from 1 - 45 will be 80.
- Simplify using the approximate values of π, $\sqrt{2}$, $\sqrt{3}$ only if it is asked to do in questions

Questions from 1 to 5 carry one mark each. (Choose correct answer from the bracket)

1. The fifth term of the arithmetic sequence4, 11, 18, …….. is _____
(*25, 24, 31, 32*)

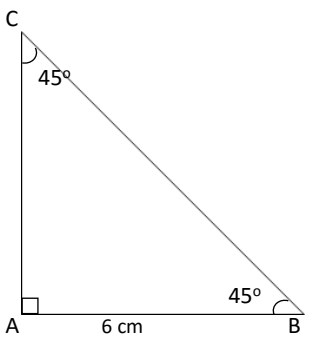
2. In the figure 'O' is the centre of circle and A, B, C, D are on it.
If ∠BAD = 70˚then∠BCD = _____

(*140˚, 110˚, 20˚, 70˚*)



3. In the figure∠ A = 90˚, ∠B = ∠C = 45˚
and AB = 6 cm. What is the length of BC?

(6 cm, 6√2cm, 6√3 cm, 12 cm)



4. Which of the following point is on the X axis?
(*(3,2), (-3, 2), (0, 5), (5, 0)*)

5. If $P(x) = x^2 + 3x + 1$, then $P(0) =$ _____
(*0, 1, 2, -1*)

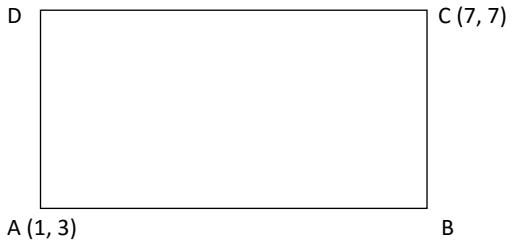
Questions from 6 to 10 Carry two score each.

6. Find the mean of the following scores.
12, 8, 13, 15, 9, 16, 11

7. Algebraic form of an arithmetic sequence is $5n+2$
a) Find the common difference of this sequence?
b) Find its 10^{th} term.

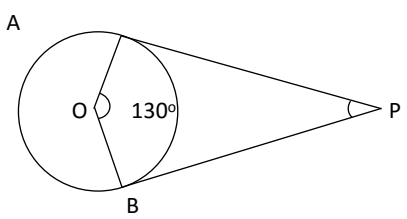
8. When each side of a square was increased by 3 cm, the area became 324 sq. cms.
a) Let x be the length of side of the original square. What is the length of side of new square?
b) What is the length of side of the original square?

9. In the figure, ABCD is a rectangle with sides parallel to the axes. Co-ordinates of A and C are (1, 3) and (7, 7) respectively. Find co-ordinates of B and D.



10. In the figure, 'O' is the centre of the circle, PA an PB are tangents.

$\angle AOB = 130^\circ$
a) Find $\angle OAP$
b) Find $\angle APB$

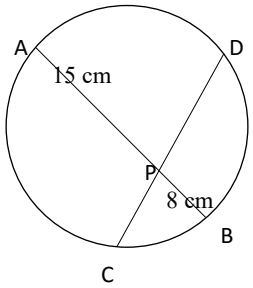


Questions from 11 to 20 Carry three score each.

11. Draw a circle of radius 3cm. Then mark a point which is 7cm away from the centre of the circle, and draw Tangents from this point to the circle.

12. In the figure, PA = 15cm, PB = 8cm and the length of PD is 2cm more than the length of PC.

a) How much is PC x PD ?
b) Let *x* as the length of PC, form a second degree equation.
c) Find length of PC?



13. The 4^{th} term of an arithmetic sequence is 64, and its 14^{th} term is 104.

a) Find its common difference?
b) Find its 13^{th} term?
c) Find the sum of first 25 term of this sequence.

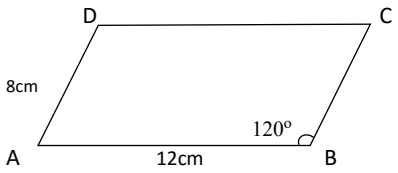
14. Construct a triangle and its circumcircle with angles 70^o, 80^o and with circumradius 4cm.

15. A bag contains 12 white balls and 8 black balls. If a ball is taken from the bag without looking into it.

a) What is the chance of being that ball is a white one?
b) What is the chance of being that ball is a black one?
c) How many white balls should be added to the bag to make the probability of drawing a black ball is $\frac{1}{3}$?

16. In the figure ABCD is a parallelogram. AB = 12 cm, AD = 8 cm, ∠B = 120˚.

a) Find ∠A ?
b) Find the length of perpendicular from D to AB
c) Find the area of parallelogram ABCD?



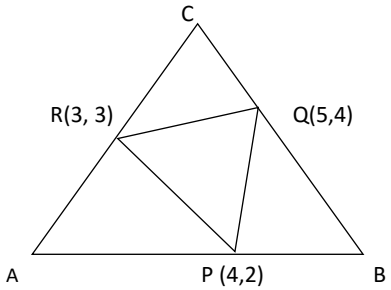
17. Base radius of a cone is 12 cm, and its height is 16 cm.
a) Find the slant height of the cone.
b) Find the radius and central angle of the sector needed to make this cone.

18. If (5, 2) is a point on the line parallel to Y axis
a) Find the coordinates of the point where this line meets the X axis.
b) Find the distance between these two points?
c) Find the distance between this line and Y axis?

19. *If* $P(x) = x^2-7x+12$
   a) Find P(3)
   b) Check whether *(x-4)* is a factor of *P(x), or not?*.
   c) Write P(x) as the product of two first degree polynomials.

20. In the figure, P(4,2),Q(5,4) and R(3,3) are mid-points of the sides of triangle ABC.

   Find co-ordinates of A,B and C



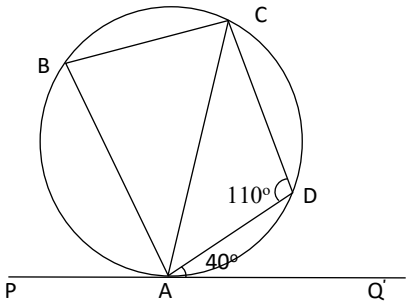
Questions from 21 to 30 carry four score each.

21. The table below shows marks of the students of a class. Find the median mark.

Mark	No; of students
12	4
15	5
18	8
21	4
24	6
27	2

22. In the figure, PQ is a tangent through the point A. ∠ADC = 110˚and∠DAQ = 40˚. Find the following angles

   a) ∠ACD
   b) ∠ABD
   c) ∠ABC
   d) ∠PAC



23. Construct a rectangle of length 6 cm and breadth 4 cm, Then construct a square having area equal to that of the rectangle.

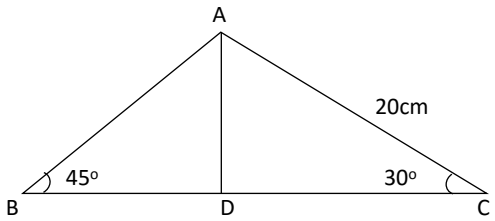
24. Find the following sums.

   a) 1+2+3+4+.....+40
   b) 4+8+12+16+.....+160
   c) 6+10+14+18+.....+162
   d) 10+18+26+34+.....+322

25. Perimeter of a rectangle is 68 cm and its area is 240 square centimeters.

a) Find sum of its length and breadth?
b) If its breath is *17-x*then what is its length?
c) Form a second degree equation and find its length and breadth.

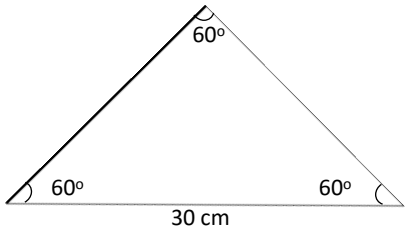
26. In the figure, AC = 20 cm.
∠B = 45˚, ∠C = 30˚and AD perpendicular to BC.



a) Find ∠BAC
b) Find the length of AD.
c) Find the perimeter of triangle ABC.
d) What is the ratio of sides of a triangle, If the ratio of its angles is 2:3:7?

27. *a)*Draw X, Y axes and mark points A (-1, 1) and B (5, 1)
*b)*If D is the mid-point of AB. Then find the coordinate of D.
*c)*If ABC is an equilateral triangle. Then find the coordinate of C

28. A lateral face of a square pyramid is as shown below



a) Find the length of its base edge.
b) Find is slant height.
c) Find the lateral surface area of the square pyramid.
d) Find the height of the square pyramid.

29. $P(x) = x^2-7x+8$

a) *Find P(1)*
b) *Write a factor of P(x) - P(1).*
c) *If (x-6) is a factor of* x^2-7x+k, then find *k*.
d) *Write P(x)-P(1)* as the product of two first degree polynomials.

30. *a)* Write an arithmetic sequence with first term 8 and common difference 3.
b) Check whether 100 is a term of this sequence or not?
c) Can the difference of any two terms of the sequence be 501?
d) At what position,125 occurs in this sequence?

Questions from 31 to 45 carry five score each.

31. Sum of 15^{th} and 16^{th} terms of an arithmetic sequence is 200.

a) What is the sum of 1^{st} and 30^{th} terms?
b) Find the sum of first 30 terms
If its10^{th} term is 78.
c) Find 21^{st} term?
d) Find the common difference?
e) Write it's algebraic form.

32. Draw a circle of radius 2.5cm, Then draw a triangle with angles 50˚, 60˚, and 70˚ and with all its sides are touching the circle.

33. A cone of maximum size is curved from a solid wooden cylinder of base radius 18 cm and height 24cm,

a) What is the base radius of the cone?
b) What is the slant height of cone?
c) Find the total surface area of the cone.
d) Find the volume of the cone.

34. Consider the arithmetic sequence 81, 77, 73, ...

a) What is the common difference?
b) What is the remainder when each positive term of this sequence is divided by 4?
c) Which is the smallest positive number of this sequence?
d) Write its algebraic form.
e) How many positive numbers are there in this sequence?

35. The table below classifies workers of a company according to their wages

Daily wages (in Rupees)	200-300	300-400	400-500	500-600	600-700	700-800
No; of workers	5	7	10	6	4	3

a) If the workers are lined up according to their daily wages, then worker in which position has the median wage?
b) Which is the median class?
c) What is the assumed wage of worker in 13^{th}position?
d) Find median daily wage.

36. A man standing in the foot of a building sees the top of a tower which is 50 meter away from the building, at an angle of elevation 60^{o}. And from the top off the building he sees the same at an angle of elevation 45^{o}.

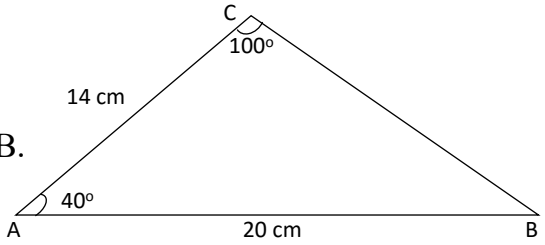
a) Draw a rough figure based on these details.
b) Find the height of the tower?
c) Find the height of the building?

37. Co-ordinates of the end points of a diameter of a circle are (1,3) and (11, 3)

a) Find the length of the diameter?
b) Write the co-ordinates of the centre.
c) Check whether (6, 8) is a point on this circle or not.
d) Write the co-ordinates of any other point on the same circle.

38. In the figure,

∠A = 40˚, ∠C = 100˚, AB = 20 cm and, AC = 14 cm.



a) Find ∠B
b) Find the length of BC
c) Find the perpendicular distance from C to AB.
d) Find the perimeter of triangle ABC.
e) Find the area of triangle ABC.

Sin 40˚ = 0.64 *cos 40˚ = 0.76*
Sin 50˚ = 0.76 *cos 50˚ = 0.64*

39. 2 is added to the product of two consecutive multiple of 7 gives 590.

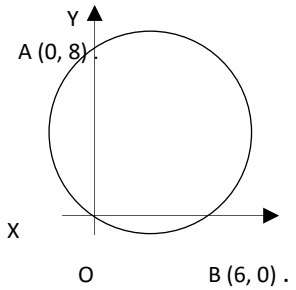
a) If the first of these two multiples is *x,* then what is the second one?
b) Form a second degree equation and find these multiples.

40. Height of a solid metallic cone is double of its base diameter?

a) If the base radius is 'r', then what is its height?
b) Find the volume of the cone.
c) This cone is melt and recast into spheres of radius equal to half the base radius of the cone. How many such spheres can be made?

41. *a)* Find the slope of the line segment AB, where A is (6,4) and B is (10, 10)
b) If the co-ordinates of C is (18, 22), Find the slope of BC.
c) Check whether A, B, and C are lying on a line or not? Why?
d) Write co-ordinates of any other point on this line.

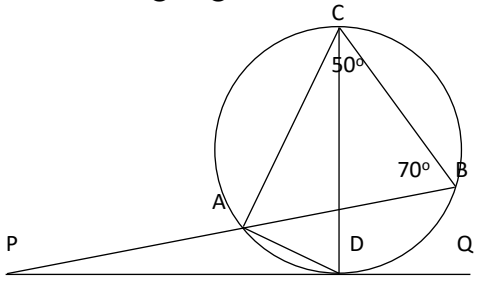
42. *a)* Find the diameter of the circle given below.
b) Find the coordinates of the centre of the circle.
c) Write the equation of the circle.



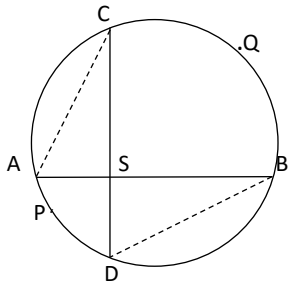
43. In figure, CD is the diameter of the circle and PQ is the tangent through D.

If ∠ACB = 50˚ and ∠ABC = 70˚, Then find the following angles.

a) ∠CAD
b) ∠ADC
c) ∠PDC
d) ∠BAD
e) ∠APQ



44. In the figure AB, CD are two chords perpendicular to each other.
If $\angle ACD = x^\circ$



a) Find $\angle ABD$
b) Find $\angle BDC$
c) Find the sum of central angles of arc APD and arc BQC.
d) If the length of arc APD is 3 cm and Length of arc BQC is 7 cm then find the perimeter of the circle.

45. All two digit numbers are written in a separate paper slips and put in to a box.
a) How many slips are there in the box?

A slip is taken from the box without looking into it, then
b) What is the probability of getting a number for which both the digits are same?
c) What is the probability of getting an even number?
d) What is the probability of getting a perfect square?
e) What is the probability of getting a number for which the sum of digits is equal to 15?