



MATHS

BOOKS - SELINA MATHS (ENGLISH)

MATHEMATICS-2020

Section A

1. Solve the following Quadratic Equation:

$$x^2 - 7x + 3 = 0$$

Given your answer correct to two decimal places.



[Watch Video Solution](#)

2. Given $A = \begin{bmatrix} x & 3 \\ y & 3 \end{bmatrix}$

If $A^2 = 3I$, where I is the identity matrix of order 2, find x and y .



[Watch Video Solution](#)

3. Using ruler and compass construct a triangle ABC where $AB = 3$ cm, $BC = 4$ cm and $\angle ABC = 90^\circ$. Hence construct a circle circumscribing the triangle ABC. Measure and write down the radius of the circle.



[Watch Video Solution](#)

4. Use factor between to factorise $6x^3 + 17x^2 + 4x - 12$ completely.



[Watch Video Solution](#)

5. Solve the following inequation and represent the solution set on the number line.

$$\frac{3x}{5} + 2 \leq x + 4 \leq \frac{x}{2} + 5, x \in R$$



Watch Video Solution

6. Draw a Histogram for the data, using a graph paper:

Weekly Wages (in ₹)	No. of People
3000–4000	4
4000–5000	9
5000–6000	18
6000–7000	6
7000–8000	7
8000–9000	2
9000–10000	4

Estimate the mode from the graph.



[Watch Video Solution](#)

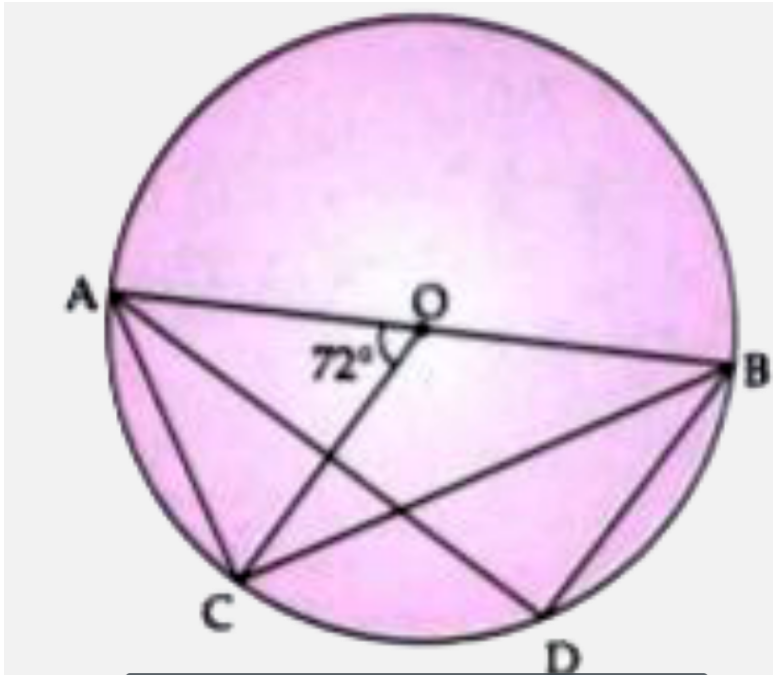
7. In the figure given below, O is the centre of the circle and Ab is a diameter.

If $AC = BC$ and $\angle AOC = 72^\circ$. Find:

(i) $\angle ABC$

(ii) $\angle BAD$

(iii) $\angle ABD$



Watch Video Solution

8. Prove that:

$$\frac{\sin A}{1 + \cot A} - \frac{\cos A}{1 + \tan A} = \sin A - \cos A$$



Watch Video Solution

9. In what ratio is the line joining P(5, 3) and Q(-5, 3) divided by the y-axis? Also find the coordinates of the point of intersection.



Watch Video Solution

10. A solid spherical ball of radius 6 cm is melted and recast into 64 identical spherical marbles. Find the radius of each marble.



Watch Video Solution

11. Each of the letters of the word 'AUTHORIZES' is written on identical circular discs and put in a bag. They are well shuffled. If a disc is drawn at random from the bag, what is the probability that the letter is:

(i) a vowel

(ii) one of the first 9 letters of the English alphabet which appears in the given word.

(iii) one of the last 9 letters of the English alphabet which appears in the given word ?



[Watch Video Solution](#)

12. Mr. Bedi visits the market and buys the following articles :

Medicines costing Rs. 950, GST @ 5%

A pair of shoes costing Rs. 3000, GST @ 18%

A Laptop bag costing Rs. 1000 with a discount of 30%, GST @ 18%

(i) Calculate the total amount of GST paid.

(ii) The total bill amount including GST paid by Mr. Bedi.



[Watch Video Solution](#)

Section B

1. A company with 500 shares of nominal value Rs. 120 declares an annual dividend of 15%.

Calculate :

(i) the total amount of dividend paid by the company.

(ii) annual income of Mr. Sharma who holds 80 shares of the company

(iii) If the return percent of Mr. Sharma from his shares is 10%, find the market value of each share.



[Watch Video Solution](#)

2. The mean of the following data is 16.

Calculate the value of f .

Marks	5	10	15	20	25
No. of Students	3	7	f	9	6



[Watch Video Solution](#)

3. The 4^{th} , 6^{th} and the last term of a geometric progression are 10, 40 and 640 respectively. If the common ratio is positive, find the first term, common ratio and the number of terms of the series.



Watch Video Solution

4. If $A = \begin{bmatrix} 3 & 0 \\ 5 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} -4 & 2 \\ 1 & 0 \end{bmatrix}$

Find $A^2 - 2AB + B^2$



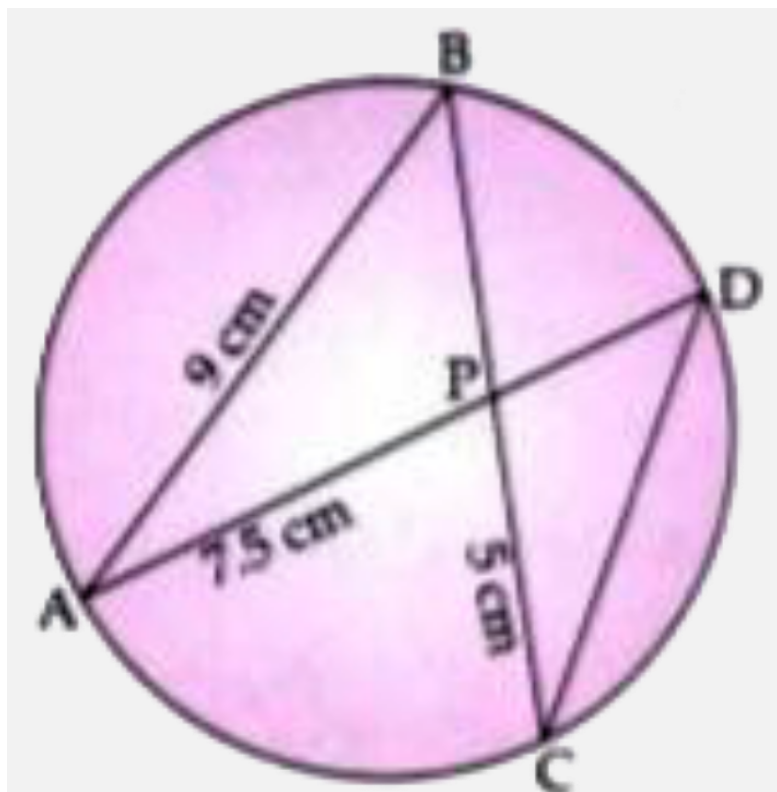
Watch Video Solution

5. In the figure given figure $AB = 9\text{cm}$, $PA = 7.5$ cm and $PC = 5$ cm. Chords AD and BC intersect at P .

(i) Prove that $\Delta PAB \sim \Delta PCD$

(ii) Find the length of CD.

(iii) Find area of $\triangle PAB$: area of $\triangle PCD$



Watch Video Solution

6. From the top of a cliff, the angle of depression of the top and bottom of a tower are observed to be 45° and 60° respectively. If the height of the tower is 20 m.

Find :

(i) the height of the cliff

(ii) the distance between the cliff and the tower.



[Watch Video Solution](#)

7. Find the value of 'p' if the lines, $5x - 3y + 2 = 0$ and $6x - py + 7 = 0$ are perpendicular to each other. Hence, find the equation of a line passing through (-2,-1) and parallel to $6x - py + 7 = 0$.



[Watch Video Solution](#)

8. Using properties of proportion find $x:y$ given:

$$\frac{x^2 + 2x}{2x + 4} = \frac{y^2 + 3y}{3y + 9}$$



[Watch Video Solution](#)

9. What must be added to the polynomial $2x^3 - 3x^2 - 8x$, so that it leaves a remainder 10 when divided by $2x + 1$?



[Watch Video Solution](#)

10. Mr. Sonu has a recurring deposit account and deposits Rs. 750 per month for 2 years. If he gets Rs. 19125 at the time of maturity, find the rate of interest.



Watch Video Solution

11. Use graph paper for this question.

Take 1 cm = 1 unit on both x and y axes.

(i) Plot the following points on your graph sheets:

A (-4, 0), B (-3, 2), C (0, 4), D(4, 1) and E (7, 3)

(ii) Reflect the point B, C, D and E on the x-axis and name them as B', C', D' and E' respectively.

(iii) Join the points A, B, C, D, E, E', D', C', B' and A in order.

(iv) Name the closed figure formed.



Watch Video Solution

12. If $x = \frac{\sqrt{2a+1} + \sqrt{2a-1}}{\sqrt{2a+1} - \sqrt{2a-1}}$, prove that

$$x^2 - 4ax + 1 = 0$$



Watch Video Solution

13. If the 6th term of an A.P. is equal to four times its first term and the sum of first six terms is 75, find the first term and the common difference.



[Watch Video Solution](#)

14. The difference of two natural numbers is 7 and their product is 450. Find the numbers.



[Watch Video Solution](#)

15. A model of a high rise building is made to a scale of 1:50.

(i) If the height of the model is 0.8 m, find the height of the actual building.

(ii) If the floor area of a flat in the building is 20 m^2 , find the floor area of that in the model.



[Watch Video Solution](#)

16. From a solid wooden cylinder of height 28 cm and diameter 6 cm, two conical cavities are hollowed out. The diameters of the cones are also of 6 cm and height 10.5 cm. Taking $\pi = \frac{22}{7}$ find the volume of the remaining solid.



[Watch Video Solution](#)

17. Prove the identity

$$\left(\frac{1 - \tan \theta}{1 - \cot \theta} \right)^2 = \tan^2 \theta$$



Watch Video Solution