MATHS

BOOKS - SELINA MATHS (ENGLISH)

MATHEMATICS-2018

Section A

1. Find the value of 'x' and 'y' if :

$$2\begin{bmatrix} x & 7 \\ 9 & y-5 \end{bmatrix} + \begin{bmatrix} 6 & -7 \\ 4 & 5 \end{bmatrix} = \begin{bmatrix} 10 & 7 \\ 22 & 15 \end{bmatrix}$$

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2. Sonia had recurring deposite account in a bank and deposited Rs 600 per month for $2\frac{1}{2}$ years. If the rate of interest was 10% p.a., find the maturity value of this account.

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3. Cards bearing numbers 2, 4, 6, 8, 10, 12, 14, 16, 18 and 20 are kept in a bag. A cord is drawn at random from the bag. Find the probability of

getting a card which is

a prime number.

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4. Cards bearing numbers 2, 4, 6, 8, 10, 12, 14, 16, 18 and 20 are kept in a bag. A cord is drawn at random from the bag. Find the probability of getting a card which is

a number divisible by 4.

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5. Cards bearing numbers 2, 4, 6, 8, 10, 12, 14, 16, 18 and 20 are kept in a bag. A cord is drawn at random from the bag. Find the probability of getting a card which is

a number that is a multiple of 6.

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6. Cards bearing numbers 2, 4, 6, 8, 10, 12, 14, 16, 18 and 20 are kept in a bag. A cord is drawn at random from the bag. Find the probability of

getting a card which is

an odd number.

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7. The circumference of the base of a cylinder vessel is 132 cm and height is 25 cm. Find the volume of cylinder.

(use $\pi = \frac{22}{7}$)

A. $34650cm^3$

B. $35650cm^3$

C. $3460cm^3$

D. None

Answer: $34650cm^3$

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8. If (k - 3), (2k + 1) and (4k + 3) are three consecutive terms of an A.P., find the value of k.

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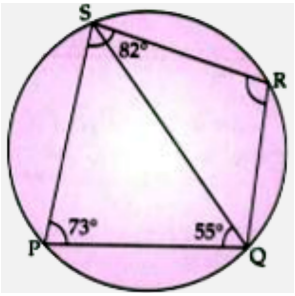
9. PQRS is a cyclic quadrilateral, Given, $\angle QPS = 73^\circ, \angle PQS = 55^\circ$ and $\angle PSR = 82^\circ$, calculate :



$\angle QRS$

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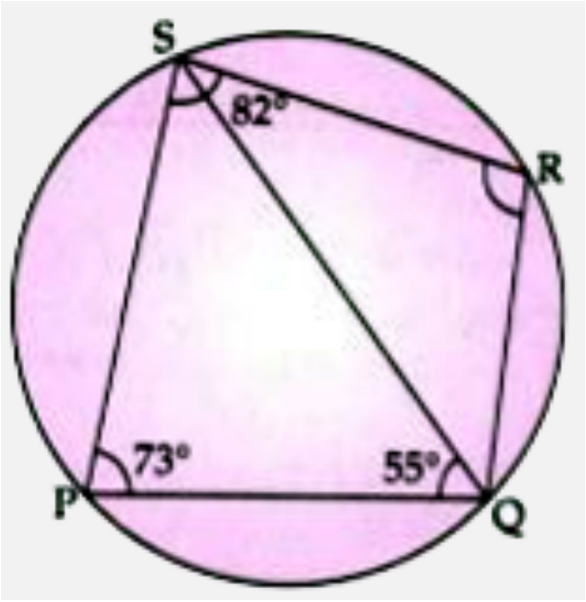
10. PQRS is a cyclic quadrilateral, Given, $\angle QPS = 73^\circ, \angle PQS = 55^\circ$ and $\angle PSR = 82^\circ$

, calculate :



(ii) $\angle RQS$

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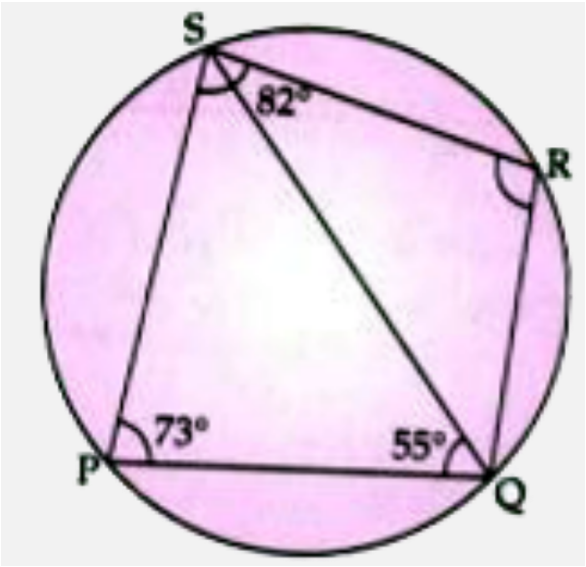
11. PQRS is a cyclic quadrilateral, Given, $\angle QPS = 73^\circ$, $\angle PQS = 55^\circ$ and $\angle PSR = 82^\circ$

, calculate :



(iii) $\angle PRQ$

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12. If (x + 2) and (x + 3) are factors of $x^3 + ax + b$, find the value of 'a' and 'b'.

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13. Prove that $\sqrt{\sec^2\theta + \operatorname{cosec}^2\theta} = \tan\theta + \cot\theta$

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14. For the given distribution showing the number of runs scored by 50 batsmen. Extimate the mode of the data :

Runs scored	3000–4000	4000–5000	5000–6000	6000–7000	7000–8000	8000–9000	9000–10000
No. of batsmen	4	18	9	6	7	2	4

A. 4100

B. 4200

C. 4400

D. 4600

Answer: D

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15. Solve the following inequation, write down the solution set and represent it on the real number line :

$-2 + 10 \leq 13x + 10 < 24 + 10x, x \in Z$

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16. If the straight lines $3x - 5y = 7$ and $4x + ay + 9 = 0$ are perpendicular to one another, find the value of a.

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17. Solve $x^2 + 7x = 7$ and give your answer correct to two decimal places.

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Section B

1. The 4th term of a G.P. is 16 and 7th term is 128. Find the first term and common ration of the series.

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2. A man invsets Rs 22,500 in Rs 50 shares available at 10% discount, If the dividend paid by the company is 12%, calculate :

(i) The number of shares purchased

Give your answer correct to the nearest whole number.

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3. A man invsets Rs 22,500 in Rs 50 shares available at 10% discount, If the dividend paid by the company is 12%, calculate the annual dividend received.

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4. A man invsets Rs 22,500 in Rs 50 shares available at 10% discount, If the dividend paid by the company is 12%, calculate the rate of return he gets in his investment.

Give your answer correct to the nearest whole number.

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5. Use graph paper for this question (Take 2 cm = 1 unit along both X and Y axis). ABCD is a quadrilateral whose vertices are A (2, 2), B (2, -2),

C (0, -1) and D (0,1). Reflect quadrilateral ABCD on the Y-axis and name it as A'B'CD.

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6. Use graph paper for this question (Take 2 cm = 1 unit along both X and Y axis). ABCD is a quadrilateral whose vertices are A (2, 2), B (2, -2), C (0, -1) and D (0,1). Reflect quadrilateral ABCD on the Y-axis and name it as A'B'CD.Write down the coordinates of A' and B'.

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7. Use graph paper for this question (Take 2 cm = 1 unit along both X and Y axis). ABCD is a quadrilateral whose vertices are A (2, 2), B (2, -2), C (0, -1) and D (0, 1). Name two points which are invariant under the above reflection by y-axis.

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8. Use graph paper for this question (Take 2 cm = 1 unit along both X and Y axis). ABCD is a quadrilateral whose vertices are A (2, 2), B (2, -2), C (0, -1) and D (0, 1). Reflect quadrilateral ABCD

on the Y-axis and name it as A'B'CD. Name the polygon A'B'CD.

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9. Using properties of proportion, solve for x. Given that x is positive :

$$\frac{2x + \sqrt{4x^2 - 1}}{2x - \sqrt{4x^2 - 1}} = 4$$

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10. If $A = \begin{bmatrix} 2 & 3 \\ 5 & 7 \end{bmatrix}, B = \begin{bmatrix} 0 & 4 \\ -1 & 7 \end{bmatrix}$ and $C = \begin{bmatrix} 1 & 0 \\ -1 & 4 \end{bmatrix}$ find $AC + B^2 - 10C$.

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11. Prove that $(1 + \cot\theta - \operatorname{cosec}\theta)(1 + \tan\theta + \sec\theta) = 2$

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12. Find the value of k for which the following equation has equal roots :

$x^2 + 4kx + \left(k^2 - k + 2\right) = 0$

A. -5 or $\frac{2}{3}$

B. -1 or $\frac{2}{3}$

C. 0 or $\frac{2}{3}$

D. None

Answer: B

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13. On a map drawn to a scale of $1:50,000$, a rectangular plot of alnd ABCD has the following dimensions. AB = 6 cm, BC = 8 cm and all angles are right angles. Find :

(i) the actual length of the diagonal distyance AC of the plot in km.

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14. On a map drawn to a scale of $1:50,000$, a rectangular plot of alnd ABCD has the following dimensions. AB = 6 cm, BCv = 8 cm and all angles

are right angles. Find :

(ii) the actual area of the plot in sq. km.

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15. A (2, 5), B(-1, 2) and C (5, 8) are the vertices of a triangle ABC, 'M' is a point on AB such that $AM : MB = 1 : 2$. Find the coordinates of 'M'. Hence, find the equation of the line passing through the points C and M.

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16. Rs 7500 were divided equally among a certain number of children. Had there been 20 less children, each would have received Rs 100 more. Find the original number of children.

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17. If the mean of the following distribution is 24, find the value of 'a'.

Marks	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50
Number of students	7	a	8	10	5

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18. Using ruler and compass only, construct a ΔABC such that BC = 5 cm and AB = 6.5 cm and $\angle ABC = 120^\circ$.

(i) Construct a circumference of ΔABC

(ii) Construct a cyclic quadrilateral ABCD, such that D is equidistant from AB and BC.

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19. Priyanka has a recurring deposite account of Rs 1000 per month at 10% per annum. If she gets Rs 5550 as interest at the time of maturity,

find the total time for which the account was held.

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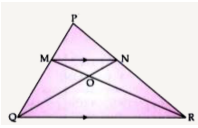
20. In ΔPQR, MN is parallel to QR and $\frac{PM}{MQ} = \frac{2}{3}$

(i) Find $\frac{MN}{QR}$



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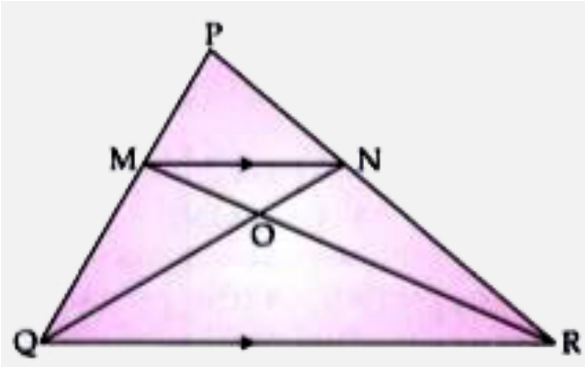
21. In ΔPQR, MN is parallel to QR and $\frac{PM}{MQ} = \frac{2}{3}$

Prove that ΔOMN and ΔORQ are similar.



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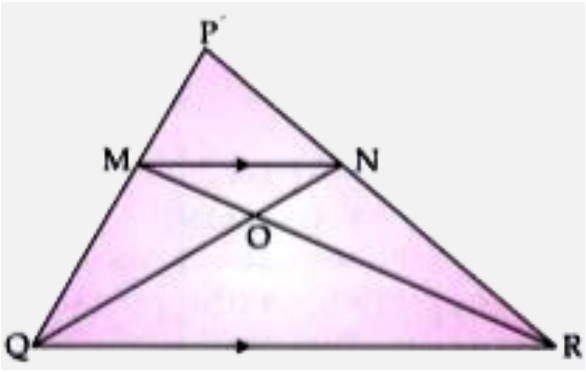
22. In ΔPQR, MN is parallel to QR and $\frac{PM}{MQ} = \frac{2}{3}$

(iii) Find, Area of ΔOMN : Area of ΔORQ.



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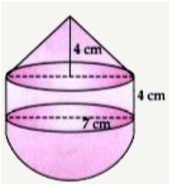
23. The following figure represents a solid consiting of right circular cylinder with a hemisphere at one end and a cone at the other. Their common radius is 7 cm. The height of the cylinder and cone are each of 4 cm. Find the

volume of the solid.



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24. Use remainder theorem to factorize the following polynomial :

$2x^3 + 3x^2 - 9x - 10$

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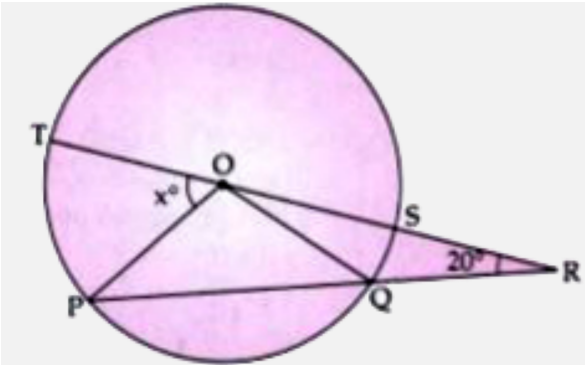
25. In the figure given below 'O' is the centre of the circle. If QR = OP and $\angle ORP = 20^\circ$. Find the value of 'x'



A. 40°

B. 65°

C. 60°

D. None

Answer: C

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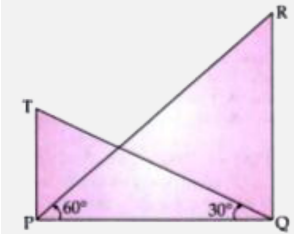
26. The angle of elevation from a point pof the top of a tower QR, 50m high is 60° and that of ther tower PT from a point Q is 30°. Find the height of the tower PT, correct to the nearest metre.



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27. The 4th term of an A.P. is 22 and 15th term is 66. Find the first term and the common difference. Hence, find the sum of the series to 8 terms.

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28. Use Graph paper for this question.

A survey regarding height (in cm) of 60 boys belonging to Class 10 of a school was conducted. The following data was recorded.

Height in cm	135–140	140–145	145–150	150–155	155–160	160–165	165–170
No. of boys	4	8	20	14	7	6	1

Taking 2 cm = height of 10 cm along one axis and 2 cm = 10 boys along the other axis draw an ogive of the above distribution. Use the graph to estimate the following :

(i) the median

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29. Use Graph paper for this question.

A survey regarding height (in cm) of 60 boys

belonging to Class 10 of a school was conducted. The following data was recorded.

Taking 2 cm = height of 10 cm along one axis and 2 cm = 10 boys along the other axis draw an ogive of the above distribution. Use the graph to estimate the following :

(iii) if above 158 cm is considered as the tall boys of the class. Find the number of boys in the class who are tall.

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30. Use Graph paper for this question.

A survey regarding height (in cm) of 60 boys belonging to Class 10 of a school was conducted. The following data was recorded.

Taking 2 cm = height of 10 cm along one axis and 2 cm = 10 boys along the other axis draw an ogive of the above distribution. Use the graph to estimate the following :

(iii) if above 158 cm is considered as the tall boys of the class. Find the number of boys in the class who are tall.

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