



# MATHS

## BOOKS - BEYOND PUBLICATION

### MODEL PAPER

#### Exercise

1. If  $\alpha$ ,  $\beta$  are zeroes of the polynomials  $2x^2 + 7x + 5$ , find the value of  $\alpha + \beta + \alpha\beta$ ?



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2. Write the set  $A = \{1, 4, 9, 16, 25, \dots\}$  in set-builder form.



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3. The larger of two complimentary angles is double the smaller. Find the angles.



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4. The height of a rectangular stockroom is 5m and perimeter of its floor is 50m. Find the outer area of the four walls to be painted.



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5. Solve the equation  $3^x = 5^{x+2}$



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6. Find the roots of the equation  $5x^2 - 6x - 2 = 0$  by the method of completing the square.



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7. A cone of height 24 cm and radius of base 6 cm is made up of modelling clay. A child reshapes it in the form of a sphere. Find the radius of the sphere.



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8. If  $a, b$  and  $c$  are the zeroes of a polynomial of degree 3, then give the relations between the zeroes and the coefficients of the polynomial.



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9. Check whether the equations  $2x-3y=5$  and  $4x-6y=15$  are consistent. Also verify by graphical representation.



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**10.** Solve each of the following pairs of equations by reducing them to a pair of linear

equations.  $\frac{10}{x+y} + \frac{2}{x-y} = 4$  and

$$\frac{15}{x+y} - \frac{5}{x-y} = -2$$



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**11.** An iron pillar consists of a cylindrical portion of 2.8 m. height and 20 cm. in diameter and a cone of 42 cm. height

surmounting it. Find the weight of the pillar if  $1 \text{ cm}^3$  of iron weighs 7.5 g.



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**12.** A contractor construction job specifies a penalty for delay of completion beyond a certain date as follow. Rs. 200 for the first day. The penalty for each succeeding day being Rs. 50 more than the preceding day. How much money does the contractor pay as penalty if he has delayed the work by 30 days?



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**13.** A rectangular park is to be designed whose breadth is 3 m less than its length. Its area is to be 4 square metres more than area of a park that has already been made in the shape of an isosceles triangle with its base as the breadth of the rectangular park and of altitude 12m. Find its length and breadth.



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14. Prove that  $3 + 2\sqrt{5}$  is irrational.



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15. If  $A = \{x \mid x \text{ is a prime number and } x < 20\}$

$B = \{x \mid 2x + 1, x \in \mathbb{w} \text{ and } x < 9\}$  then

Find  $B \cap A$ ?



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16. If  $A = \{x \mid x \text{ is a prime number and } x < 20\}$

$B = \{x \mid 2x + 1, x \in \omega \text{ and } x < 9\}$  then

Find  $B \cap A$ ?



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17. If  $A = \{x \mid x \text{ is a prime number and } x < 20\}$

then

$B = \{x \mid 2x + 1, x \in \omega \text{ and } x < 9\}$  then Find

$A - B$



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**18.** If  $A = \{x / x \text{ is a prime number and } x < 20 \}$

then

$B = \{x / 2x + 1, x \in w \text{ and } x < 9\}$  then Find

B-A. What do you observe?



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**19.** The coach of a cricket team of M.K.Nagar

High School buys 3 bats and 6 balls for Rs.

3900. Later he buys one more bat and 2 balls

for Rs. 1300. Identify the unknowns in each

situation. We observe that there are two unknowns in each case.



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**20.** Solve the quadratic polynomial  $x^2 - 3x - 4$  by graphical method.



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**21.** The H.C.F of 31, 43 and 47 is.....

A. 121

B. 1

C. 31

D. 43

**Answer:**



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**22.** If  $x + y + z = xyz$ , then  $\sum \frac{2x}{1 - x^2} =$

A. 1

B. 2

C. -2

D. -1

**Answer:**



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**23.**  $n(A) = 14$ ,  $n(B) = 11$ ,  $n(A \cap B) = 19$  then

$n(A \cup B) = \dots$

A. 6

B. 16

C. 22

D. 25

**Answer:**



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**24.** If a fraction becomes 2 when 9 is added to its numerator and 1 when 2 is subtracts from its denominator then the fraction is.....

A.  $\frac{5}{8}$

B.  $\frac{8}{5}$

C.  $\frac{5}{7}$

D.  $\frac{7}{9}$

**Answer:**



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**25.** The sum of squares of two consecutive positive even numbers is 340, then the numbers are.....



A. 12,14

B. 10,12

C. 14,16

D. 16,18

**Answer:**



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**26.** Which term of G.P.  $3, 3\sqrt{3}, 9, \dots$  equals to 243?

A. 6

B. 7

C. 8

D. 9

**Answer:**



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**27.** If  $\sqrt{a} + \sqrt{b}$  is an irrational number, then which of the following is false?

A. 1. 'a' and 'b' are prime

B. 2. 'a' or 'b' is prime

C. 3. 'a' and 'b' are any integers

D. 4. one of 'a' or 'b' is not a perfect square

**Answer:**



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**28.** The graph  $y=ax+b$  is a straight line which intersects X-axis at

A.  $\left(0, \frac{a}{b}\right)$

B.  $\left(\frac{b}{a}, 0\right)$

C.  $\left(0, -\frac{b}{a}\right)$

D.  $\left(-\frac{b}{a}, 0\right)$

**Answer:**



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**29.** If  $x^2 + ax + b = 0$ ,  $x^2 + bx + a = 0$  have a common roots then

A.  $a + b = 0$

B.  $ab = 1$

C.  $a + b = 1$

D.  $a + b + 1 = 0$

**Answer:**



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**30.** Coefficient of  $x$  in a polynomial

$ax^2 + bx + c$  is '0'. Then its zeroes are

A. equal

B. additive inverses to one another

C. multiplicative inverses to one another

D. none

**Answer:**



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**31.** The series  $(n-1), (n-2), (n-3), \dots$  Is a type of

A. AP

B. GP

C. may be both

D. none

**Answer:**



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**32.** A metal cuboid of dimension  $22\text{cm} \times 15\text{cm} \times 7.5\text{cm}$ , was melted and cast into a cylinder of height 14 cm .What is its radius?

A. 15 cm

B. 7.5 cm

C. 22.5 cm

D. 7 cm

**Answer:**



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**33.** If  $\log a, \log b, \log c$  are in A.P. then  $a, b, c$  are

A. A.P



B. G.P

C. Both A.P and G.P

D. neither A.P nor G.P

**Answer:**



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**34.** To calculate the quantity of milk inside a bottle, we need to find out.....

A. Area

B. Volume

C. Density

D. Total surface area

**Answer:**



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**35.** The altitude of a right triangle is 7 cm less than its base. If the hypotenuse is 13 cm, find the other two sides.

A. 15 cm, 8 cm

B. 12 cm, 5 cm

C. 24 cm, 17 cm

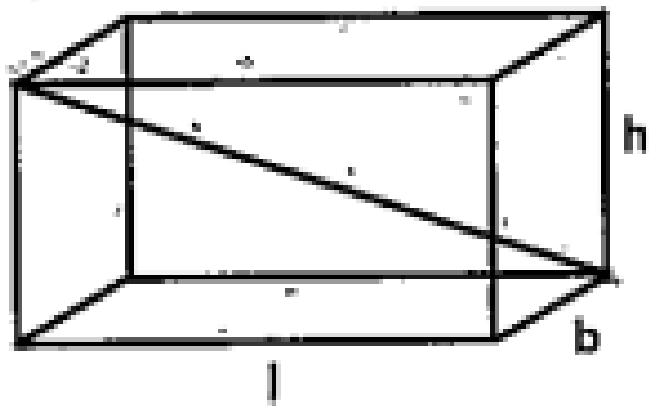
D. All above

**Answer:**



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**36.** Length of the dark line given in the diagram



A.  $1. \sqrt{l^2 + b^2}$

B.  $2. \sqrt{l^2 + b + h}$

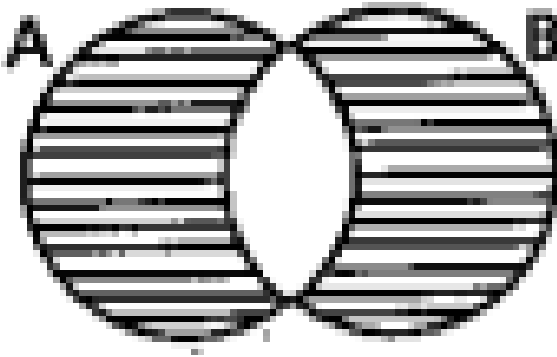
C.  $3. \sqrt{l^2 + b^2 + h^2}$

D.  $4. \sqrt{l + b + h}^2$

**Answer:**



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37.

The shaded area in the figure shows

A. 1.  $A - B$

B. 2.  $B - A$

C. 3.  $A \cap B$

D. 4.  $(A \cup B) - (A \cap B)$

**Answer:**



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**38.** Solution of  $x-y=2, x+y=0$  lies in....quadrant.

A. I

B. IV

C. II

D. III

**Answer:**



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**39.** Inconsistent equations may represent.

- A. intersect lines
- B. parallel lines
- C. coinciding lines
- D. B or C

**Answer:**



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**40.** If  $C(4, P)$  is a point on the line segment joining the points  $A(6,5)$  and  $B(2, 11)$

Explain condition for the point  $C$  to become the mid point of  $AB$ .



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**41.** A boy observes that the length of his shadow is equal to his height. What is the angle of elevation of the Sun rays?



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**42.** In a class of 35, 28 students brought junk food for their lunch. What was the probability that a student at random would have brought healthy food?



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**43.** The circumference of a circle exceeds the diameter by 16.8 cm. Find the circumference of the circle.



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**44.** Compare the areas of two equilateral triangles which are constructed on side of a square and its diagonal.



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**45.** An ant is at  $(4,5)$  on graph sheet mounted of a wall. If it moves to a point  $(5,2)$  and turns to reach another point  $(3,6)$ . Find the distance travelled by the ant.



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46. Show that

$$(1 - \sin \theta)(1 + \sin \theta)(1 + \tan^2 \theta) = 1$$



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47. Find the median of the following distribution.

CI	65-85	85-105	105-125	125-145	145-165	165-185	185-205
f	3	4	12	15	14	12	8



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**48.** A box contains 25 balls numbered as 1,2,3.....25. A ball is drawn from the box at random. What is the probability for getting the ball bearing the number, that is divisible by 6



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**49.** A box contains 25 balls numbered as 1,2,3.....25. A ball is drawn from the box at random. What is the probability for getting

the ball bearing the number, that  
is a prime number.



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**50.** Prove that a line drawn through the midpoint of one side of a Triangle parallel to another side bisects the third side (Using Basic proportionality theorem).



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51. Vertices of a triangle ABC are A (3,5) B(7,4) and C (10,8). The mid point of the side BC, CA and AB are D,E and F respectively. Are the centroids of  $\triangle ABC$  and  $\triangle DEF$  are same or not?

A. `

B.

C.

D.

**Answer:**



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52. If  $\tan x = \frac{5}{12}$ , then find  $\sec x$ .



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53. There is a tower beside the road, Rahim standing at the top of the tower observes two cars A and B on either side of the tower at an angle of depression  $30^\circ$  and  $60^\circ$  are approaching the foot of the tower with a

uniform speed of  $10\frac{m}{sec}$  and  $5m/sec$  respectively. If the height of the tower is  $100\sqrt{3}$ , then find the which car reaches the tower first and how many seconds the other car is late by the first one.



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**54.** A bag contains 6 yellow balls and some green balls. The probability of getting a green ball is triple that of a yellow ball. Determine number of Green balls in the bag and find the



probability of each colour ball when a ball is drawn at time randomly.



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**55.** Ramu has a triangular site. He observes the corners of the triangular site are  $(2,3)$ ,  $(4,1)$ ,  $(-2,5)$ . Find the area of the swimming pool dug by joining of the mid points of the sides of the site.



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**56.** Draw a circle of diameter 6 cm from a point 5 cm away from its centre . Construct the pair of tangents to the circle and measure their length .



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**57.** If slope of a line is “1” then the angle between the line and X -axis is

A.  $30^\circ$

B.  $45^\circ$

C.  $60^\circ$

D.  $90^\circ$

**Answer:**



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58. 
$$\frac{\sec^4 A - \tan^4 A}{\sec^2 A - \tan^2 A} = \dots\dots\dots$$

A. 1. 1

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

C. 3. 2

D. 4. 2/3

**Answer:**



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**59.** The angle of elevation of the sun when length of the shadow of a pole is  $\sqrt{3}$  times the height of the pole is

A.  $45^\circ$

B.  $30^\circ$

C.  $60^\circ$

D.  $90^2$

**Answer:**



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**60.** Three coins are tossed simultaneously then probability of getting at least one tail is....

A.  $\frac{3}{4}$

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

C.  $\frac{7}{8}$

D.  $\frac{2}{3}$

**Answer:**



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**61.** The mean of a data set consisting of 20 observation is 40. If one observation 53 was wrongly recorded as 33, then the correct mean will be

A. 26

B. 39

C. 41

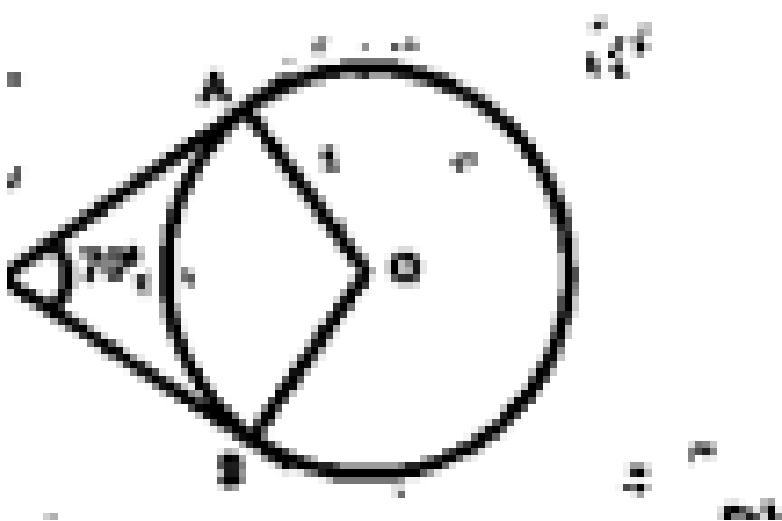
D. 46

**Answer:**



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**62.** From the figure if  $\angle APB = 70^\circ$  then  
 $\angle AOB = \dots$



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**63.** The following line has only one point in common to the circle

A. diameter

B. tangent



C. secant

D. chord

**Answer:**



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**64.** Which of the following is not possible?

A.  $\sin \theta = 0.5$

B.  $\cos \theta = 0$

C.  $\tan \theta = 2$

$$D. \sin \theta = 1$$

**Answer:**



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**65.** Which of the following is correct?

A. class

mark=

$$\frac{\text{upperclass lim it} - \text{lowerclass lim it}}{2}$$

B. class

mark=

$$\frac{\text{upperclass lim it} + \text{lowerclass lim it}}{2}$$

C. Class mark = Upper Boundary-Lower

Boundary

D. Class mark = Upper Boundary+Lower

Boundary

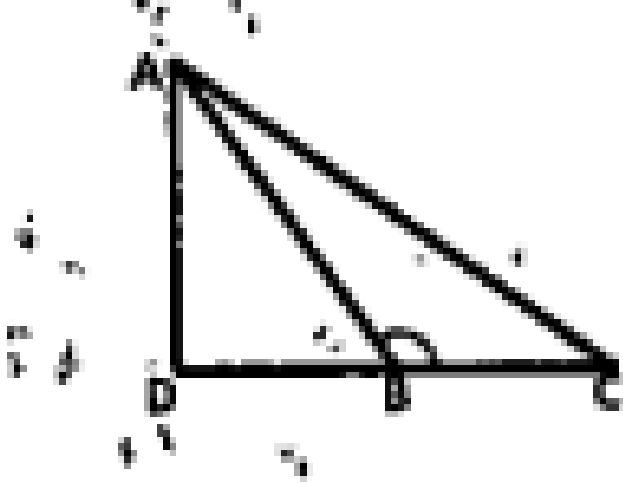
**Answer:**



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**66.** In the figure  $\angle B$  is an obtuse angle, then

$AC^2 = \dots\dots\dots$



A.  $AB^2 + BC^2 - BD^2$

B.  $AB^2 + BC^2$

C.  $AB^2 + BC^2 + 2BC \cdot DB$

D.  $AB^2 + BC^2 - 2BC > DB$

**Answer:**



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67. Modal class of the following distribution is

Age	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60
No. of Patients	12	09	05	10	25	18

- A. 10 – 20
- B. 20 – 30
- C. 30 – 40
- D. 40 – 50

**Answer:**



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68. Find the probability of existing 53 sundays  
in a common year.

A.  $\frac{52}{53}$

B.  $\frac{1}{52}$

C.  $\frac{1}{7}$

D.  $\frac{6}{7}$

**Answer:**



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69. Match the following.

1)  $\cos (180 + \theta)$  ( )

2)  $\sec (270 + \theta)$  ( )

3)  $\tan (90 + \theta)$  ( )

a)  $\cot \theta$

b)  $\cos \theta$

c)  $\operatorname{cosec} \theta$

A. 1b, 2c, 3a

B. 1c, 2b, 3a

C. 1a, 2b, 3c

D. 1c, 2a, 3b

**Answer:**



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70.  $(0,0)$   $(0,1)$   $(1,0)$  are vertices of a .....triangle.

- A. Right angle
- B. Isosceles
- C. Right isosceles
- D. Equilateral

**Answer:**



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71. If two towers of height  $X$  and  $Y$  subtend angles of  $30^\circ$  and  $60^\circ$  respectively at the centre of the line joining their feet, then  $X:Y$  is equal to

A.  $\sqrt{3}:1$

B.  $1:\sqrt{3}$

C.  $3:1$

D.  $1:3$

**Answer:**



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