

HASSAN TALUQ MATHEMATICS FORUM

Model question paper -1 (Target 40)

Group 1

Subject: Mathematics

Class: 10

I. Choose the correct answer for the following questions.

2 X 1 = 2

1. The 9th term of an AP is 4, 9, 14, is.

- a)17 b)44 c)36. d)40

2. If $\cos = \sqrt{3}/2$ the magnitude of angle A is.

- a)0° b)30° c)45° d)60°

II. Answer the following.

3 X 1 = 3

3. write the discriminant of the quadratic equation $x^2 + bx + c = 0$

4. Write the formula to find the volume of sphere.

5. Write the formula to find the distance between original and point P (x,y).

III. solve.

6 X 2 = 12

6. If $a_n = 3n - 2$ then find the first four terms of AP.

7. Draw a line segment 7.4 cm and divide in the ratio 3 : 2.

8. Solve by elimination method. $3x - 5y - 4 = 0$. ,. $9x - 2y + 7 = 0$.

9. Find the distance between the points P (2, 3) and Q(4, 1) using distance formula.

10. Find the roots of $x^2 - 3x - 4 = 0$ by formula method.

11. If $15 \cot A = 8$ then find the ratio of remaining trigonometric functions.

IV. Answer the following questions.

5 X 3 = 15

12. Construct a triangle of side 4 cm, 5 cm, and 6 cm and then in a triangle similar to it whose sides are $2/3$ of the corresponding sides of the first triangle.

13. Prove that "The tangent of any point of a circle is perpendicular to the radius through the point of contact".

14. The following distribution gives the daily income of 50 workers of a factory

Daily income in rupees	100 — 120	120 — 140	140 — 160	160 — 180	180 —200
Number of workers	12	14	8	6	10

Convert the distribution above to a less than type cumulative frequency distribution and draw its ogive.

15. The following table gives the literacy rate (in percentage) of 35 cities, find the mean literacy rate

Literacy rate in %	45 – 55	55 – 65	65 – 75	75 – 85	85 – 95
Number of cities	3	10	11	8	3

16. Check whether $(5, -2)$, $(6, 4)$ and $(7, -2)$ are the vertices of an isosceles triangle.

V. Answer the following.

4 X 4 = 16

17. Prove that "If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, the other two sides are divided in the same ratio".

18. Solve graphically : $x+y=14$ $x-y=4$

HASSAN MATHEMATICS FORUM

Model question paper -2 (Target 40)

Group 2

Subject: Mathematics

Class: 10

I Multiple Choice Questions:

1x3=3

- 5,9,13.....are in AP then the 10th term is,
A)36 B)31 C)41 D)21
- The distance between two points P(x₁, y₁) and Q(x₂, y₂) is given by ,
A) $\sqrt{(x_1 + x_2)^2 + (y_1 + y_2)^2}$ B) $\sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$
C) $\sqrt{(x_1 + x_2)^2 + (y_1 - y_2)^2}$ D) $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$
- A pair of linear equations are said to be consistent when,
A) $a_1/a_2 = b_2/b_1 \neq c_1/c_2$ B) $a_1/a_2 = b_2/b_1$ C) $a_1/a_2 = b_2/b_1 = c_1/c_2$
D) $a_1/a_2 \neq b_1/b_2$

II Answer the following:

1x2=2

- State Thales Theorem.
- Write the formula to find the volume of a Frustum of the cone.

III Answer the following:

2x6=12

- How many two digit numbers are divisible by 7?
- Solve $2x + y = 5$
 $2x - y = 3$
- Draw a line segment of length 8.6cm and divide it into ratio 5:3. Measure the two parts.
- Find the distance between the pair of points (-5,7) and (-1,3).
- Find the roots of the quadratic equation $2x^2 + x - 6 = 0$ by using factorization method.
- If $\sin \theta = 3/5$. Calculate $\cos \theta$ and $\cot \theta$.

IV Answer the following:

3x5=15

- Construct a triangle with sides 5cm, 6cm, and 7cm and then another triangle whose sides are $\frac{3}{4}$ of the corresponding sides of the first triangle.
- Prove that, the lengths of tangents drawn from an external point to a circle are equal .
- The following table gives production yield per hectare of wheat of 100 farms of a village .

Production yield (kg/h)	50.-55	55-60	60-65	65-70	70-75	75-80
Number of farms	2	8	12	24	38	16

Change the distribution to a more than type distribution and draw its ogive.

15. The following frequency distribution gives the monthly consumption of electricity of 68 consumers of a locality. Find the Median.

Monthly Consumption	No of consumers
65-85	4
85-105	5
105-125	13
125-145	20
145-165	14
165-185	8
185-205	4

16. Prove that , the vertices of A(-2,3) ,B(4,3), C(4,-1) and D(-2,-1) form a rectangle.

V. Answer the following:

4x2=8

17. Prove that , if in two triangles corresponding angles are equal then their corresponding sides are in the ratio and the two triangles are similar.

18. Solve graphically. $2x - y = 2$

$$4x - y = 4$$

HASSAN MATHEMATICS FORUM

Model question paper -3 (Target 40)

Group 3

Subject: Mathematics

Class: 10

I. Choose the right answer .

1X3=3

1. If $a_n = 3 + 4n$ then $a_5 = \dots\dots\dots$

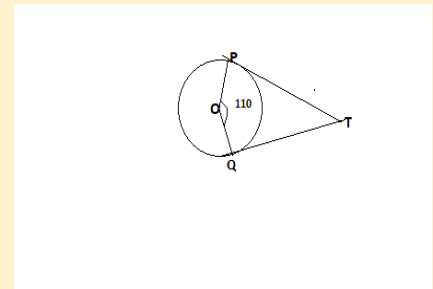
- a) 20 b) 23 c) 5 d) 3

2. $\sin^2 30^\circ + \cos^2 30^\circ = \dots\dots\dots$

- a) 1 b) 0 c) $\frac{1}{2}$ d) $\frac{3}{4}$

3. In fig $\angle POQ = 110^\circ$ then $\angle PTQ$ is $\dots\dots\dots$

- a) 110° b) 140° c) 70° d) 50°



II. Answer the following .

1X2=2

4. Write the formula for total surface area of a hemisphere

5. State Thales theorem.

III. Answer the following

2x6=12

6. Find the sum of first 20 terms in the given AP 2, 7, 12, $\dots\dots\dots$

7. Solve the pair of linear equations by elimination method : $3x + 4y = 10$, $2x - 2y = 2$

8. Draw a line segment of length 7.6 cm and divide it in the ratio 5 : 8 .

9. Find the distance between the points (2 , 3) and (4 , 1) .

10. Solve by formula method : $m^2 = 2 + 2m$

11. If $5 \sin \theta = 4$ then find $\cos \theta$ and $\tan \theta$.

IV. Answer the following

3x5=15

12. Construct a triangle PQR in which $PQ = 5\text{cm}$, $QR = 4\text{cm}$ and $\angle Q = 70^\circ$ and then another triangle whose sides are $\frac{5}{3}$ of corresponding sides of the first triangle .

13. Prove that " The lengths of tangents drawn from an external point to a circle are equal".

14. Draw "less than ogive" for the following distribution.

Marks	0-10	10 – 20	20-30	30- 40	40- 50	50-60
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obtained						
No of students	8	12	15	10	20	5

15. Find the mode of the following distribution.

C I	0 -10	10 -20	20-30	30 - 40	40 - 50
f	3	5	9	5	3

16. Find the area of a triangle whose vertices are $(-5, 1)$, $(3, -5)$ and $(5,2)$.

V. Answer the following

$$4 \times 2 = 8$$

17. Prove that " The ratio of the areas of two similar triangles is equal to the square of the ratio of their corresponding sides .

18. Solve graphically : $x+3y =6$

$$2x-3y=12.$$

HASSAN MATHEMATICS FORUM
Model question paper -4 (Target 40)

Group 4

Subject: Mathematics

Class: 10

I . Choose the correct answer

1×3=3

1.If the n^{th} term of an A.P is $5n+3$,then the 3^{rd} term is

a.11. b.18. C.12. d.13

2. If the volume and surface area of the sphere is equal then the radius is

a.3cm. b.6cm. c.9cm. d.12cm

3.If the sides of two similar triangles are in the ratio 4 : 9, areas of these triangles are in the ratio

a.2:3. b.4:9. c.81:16. d.16:81

II Answer the following:

1×2=2

4. The distance from the point P(4,5) to the origin is _____

5. Check whether the following is a quadratic equation or not. $(X+1)^2 = 2(x-3)$

III Answer the following.

6×2=12

6 Find the sum of A.P 34 +32+ 30+10

7. Solve: $3x-5y-4=0$

$9x=2y+7$ using elimination method.

8. Draw a circle of radius 6 cm.Construct a pair of tangents from a point 10 cm away from the centre of the circle and measure their length.

9. Solve: $x^2-3x-10=0$ by factorization method.

10. Find the distance between the points (-5,7) and (-1,3).

11. If $15\cot A=8$, find $\sin A$ and $\sec A$.

IV Answer the following.

3×5=15

12. Construct a triangle of sides 6.5 cm and 7 cm and 10 triangles in the treat whose sides are $\frac{5}{3}$ of the corresponding sides of the first triangle.

13. Prove that the lengths of the tangents drawn from an external point to a circle are equal.

14. The annual profits earned by 40 shops of a shopping complex in a locality give rise to the following distribution. Change the distribution to a more than type and draw its ogive.

Profit(in lakhs)	10-20	20-30	30-40	40-50	50-60	60-70
No. of shops	5	7	10	8	6	4

15. Consider the following distribution of daily wages of 90 workers of a factory. Find the mean for the given data.

Daily wages (in rs)	300-350	350-400	400-450	450-500	500-550	550-600
No. of workers	15	18	14	20	13	10

16. Check whether the points P(0,4), Q(-2,0) and R (2,0) are the vertices of an equilateral triangle.

V Answer the following.

4×2=8

17. prove that "In a right angled triangle, square of the hypotenuse is equal to the sum of the squares on the other two sides".

18. Solve graphically: $x+y=4$

$$x-y=2$$

HASSAN MATHEMATICS FORUM
Model question paper -5 (Target 40)

Group 5

Subject: Mathematics

Class: 10

I. Choose the correct answer for the following questions.

2 X 1 = 2

1. The 9th term of an AP is 4 , 9 ,14 , is.
a)17 b)44 c)36. d)40
2. If $\cos A = \frac{\sqrt{3}}{2}$ the magnitude of angle A is.
a)0° b)30° c)45° d)60°

II. Answer the following.

3 X 1 = 3

3. write the discriminant of the quadratic equation $x^2 + bx + c = 0$
4. Write the formula to find the volume of sphere.
5. Write the formula to find the distance between original and point P (x,y).

III. solve.

6 X 2 = 12

6. If $a_n = 3n - 2$ then find the first four terms of AP.
7. Draw a line segment 7.4 cm and divide in the ratio 3 : 2.
8. Solve by elimination method. $3x - 5y - 4 = 0$, $9x - 2y + 7 = 0$.
9. Find the distance between the points P (2, 3) and Q(4,1) using distance formula.
10. Find the roots of $x^2 - 3x - 4 = 0$ by formula method.
11. If $15 \cot A = 8$ then find the ratio of remaining trigonometric functions.

IV. Answer the following questions.

5 X 3 = 15

12. Construct a triangle of side 4 cm ,5 cm ,and 6 cm and the in a triangle similar to it whose sides are $\frac{2}{3}$ of the corresponding sides of the first triangle.
13. Prove that "The tangent of any point of a circle is perpendicular to the radius through the point of contact".

14.the following distribution gives the daily income of 50 workers of a factory

Daily income in rupees	100 — 120	120 —140	140 —160	160 —180	180 —200
Number of workers	12	14	8	6	10

Convert the distribution above to a less than type cumulative frequency distribution and draw its ogive.

15.The following table gives the literacy rate(in percentage)of 35 cities ,find the mean literacy rate

Literacy rate in %	45 – 55	55 – 65	65 – 75	75 – 85	85 – 95
Number of cities	3	10	11	8	3

16.check whether(5 , - 2) , (6 4) and (7 , - 2) are the vertices of an isosceles triangle.

V. Answer the following.

4 X 4 =16

17.prove that" If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points the other two sides are divided in the same ratio".

18. Solve graphically : $x+y=14$. $x-y=4$.

HASSAN MATHEMATICS FORUM
Model question paper - 6 (Target 40)

Group 6

Subject: Mathematics

Class: 10

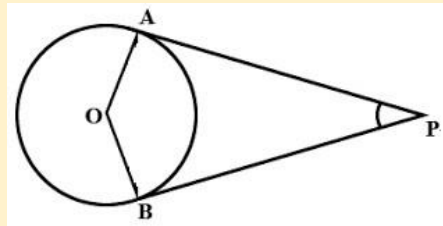
I. Multiple choice questions :

1×2=2

- 1) If 2, 5, 8 are in AP, then the 10th term is _____
a) 27 b) 26 c) 29 d) 31

- 2) In the given figure, if $\angle APB = 40^\circ$ then $\angle AOB =$ _____

- a) 140°
b) 40°
c) 100°
d) 80°



II. Answer the following questions :

1×3=3

- 3) Find the distance between the origin and the given points A(3,4) 4) Write the general form of quadratic equation.
5) Write the formula used to find the frustum of a cone.

III. Answer the following questions :

2×6=12

- 6) Find the sum of first 50 odd natural numbers.
7) Solve $x+y=5$ and $2x-3y=4$ by elimination method.
8) Draw a circle of radius 3.5cm and construct two tangents to it, the angle between them is 60° .
9) If the distance between the co-ordinate points (2, 3) and (10, y) is 10 units. Find the value of y.
10) Solve $x^2-3x-10=0$ by factorisation method.
11) If $15\cot A = 8$, find $\sin A$ and $\sec A$.

IV. Answer the following questions :

3×5=15

- 12) Construct a triangle with sides 5 cm, 6 cm and 7 cm and then another triangle whose sides are $\frac{5}{7}$ of the corresponding sides of first triangle.

- 13) Prove that the length of tangents drawn from an external point to a circle are equal.
- 14) Construct ogive (more than type) for the following data :

Production of yield (in kgs)	No. of fields
50-55	2
55-60	8
60-65	12
65-70	24
70-75	38
75-80	16

- 15) Find the mode for the following data :

Ages (in years)	No. of patients
5-15	6
15-25	11
25-35	21
35-45	23
45-55	14
55-65	5

- 16) Find the area of the triangle whose vertices are (5, 2) (4, 7) and (7, -4).

V. Answer the following questions :

2×4=8

- 17) Prove that if in two triangles corresponding angles are equal, then their corresponding sides are in the same ratio and hence the two triangles are similar.
- 18) Solve the equations by graphically. $x+y=6$ $x - y = 4$

HASSAN MATHEMATICS FORUM
Model question paper -7 (Target 40)

Group 7

Subject: Mathematics

Class: 10

1. The coordinates of the origin is _____

- a) (x, y) b) $(x, 0)$ c) $(0, 0)$ d) $(0, y)$

2. If the pair of linear equation $a_1x+b_1y+c_1=0$ & $a_2x+b_2y+c_2=0$ has infinitely many solutions then the condition is

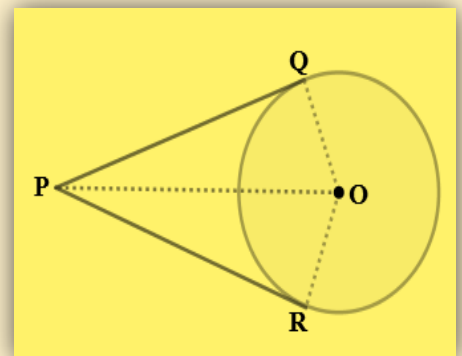
- A) $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$ B) $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$ C) $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$ D) None of these

3. First term and common difference in $5, 9, 13, \dots$ is

- a) $(5, 3)$ b) $(9, 4)$ c) $(5, 4)$ d) $(13, 4)$

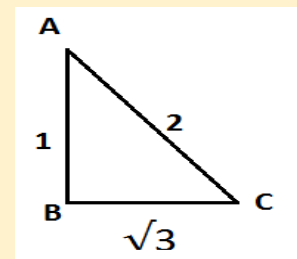
4. If PQ and PR are the two tangents to a circle with centre 'o' so that $\angle RPQ = 70^\circ$ then $\angle ROQ =$ _____

- a) 110° b) 100° c) 70° d) 90°



5. In the figure the value of cosec C is

- a) $\frac{\sqrt{3}}{2}$ b) 2 c) 1 d) _____



6X2=12

II. Carries two marks.

6. Find the sum of 10 terms of an AP $2, 7, 12, \dots$

7. Solve the equations by elimination method: $x + y = 1$
 $x - y = 5$

8. Draw a pair of tangent to a circle of radius 4cm which are inclined each other at an angle of 80° .

9. Find the distance between the points (1 , 7) and (-4 , 2)

10. Solve the equation $x^2 - 5x + 6 = 0$ by formula method

11. If $\tan 2A = \cot (A - 18^{\circ})$, Where $2A$ is an acute angle find the value of A .

III. Carries three marks.

5X3=15

12. Draw a triangle ABC with side $BC=6\text{cm}$, $AB = 5\text{cm}$ and $\angle ABC = 60^{\circ}$.

then construct a triangle whose sides are $\frac{3}{4}$ of the corresponding sides of first triangle.

13. Prove that ' The tangent at any point of a circle is perpendicular to the radius through the point of contact'.

14. Draw less than type Ogive curve for the following data.

CI	5-10	10-15	15-20	20-25	25-30	30-35	35-40
f	2	12	2	4	3	4	3

15. Find the mean for following grouped frequency distribution table

CI	10-20	20-30	30-40	40-50	50-60	60-70
f	2	3	7	6	6	6

16 . Find the coordinates of the point which divides the join of (-3 , 5) and (4 , -9) in the ratio 1:6.

IV. Carries Four marks.

2X4=8

17. Prove that 'The ratio of the areas of two similar triangle is equal to the square of the ratio of their corresponding sides'.

18. Solve the pair of linear equation graphically : $x + 3y = 6$ & $2x - 3y = 12$.

HASSAN MATHEMATICS FORUM
Model question paper - 8 (Target 40)

Group 8

Subject: Mathematics

Class: 10

I. Answer the following questions

5 X 1 = 5

- 1) If $a_n = 2n - 1$, then find the value of a_3 .
- 2) State converse of Pythagoras theorem.
- 3) What is the maximum number of tangents that can be drawn to a circle from an external point?
- 4) What is the value of $\tan^2 A - \sec^2 A$, if $0^\circ \leq A < 90^\circ$?
- 5) Write the empirical relationship among the measures of central tendency.

II. Answer the following questions

6 X 2 = 12

- 6) Find the sum of an AP 2, 7, 12, ... to 25 terms.
- 7) Solve: $x + y = 5$ and $2x - 3y = 4$ by elimination method.
- 8) Draw a circle of radius 3.5 cm. Construct a pair of tangents to it such that angle between the radii is 120° .
- 9) Find the distance between the points (2, 3) and (4, 1).
- 10) Solve: $x^2 - 15x + 50 = 0$ by factorization.
- 11) If $\sin A = \frac{3}{5}$ then find the value of $\tan A$.

III. Answer the following questions

5 X 3 = 15

- 12) Construct a triangle of side 6 cm, 7 cm and 8 cm and then a triangle similar to it whose sides are $\frac{3}{4}$ of the corresponding sides of the first triangle.
- 13) Prove that, "The length of tangents drawn from an external point to a circle are equal".
- 14) The following table gives production yield per hectare of wheat of 100 farm of a village. Change the distribution to a *more than type distribution* and draw its ogive.

Production Yield(kg/ha)	50 - 55	55 - 60	60 - 65	65 - 70	70 - 75	75 - 80
No. of farms	2	8	12	24	38	16

- 15) The distribution below gives the weights of 30 students of a class, find the *median* weight of the students.

Weights(kg)	40 - 45	45 - 50	50 - 55	55 - 60	60 - 65	65 - 70	70 - 75
Number of students	2	3	8	6	6	3	2

- 16) Find the area of the quadrilateral whose vertices taken in order are (-4, -2); (-3, -5); (3, -2) and (2, 3).

IV. Answer the following questions

2 X 4 = 8

- 17) Prove that, "In a right triangle, square of the hypotenuse is equal to the sum of the squares on the other two sides".
- 18) Solve graphically: $3x - y = 5$ and $2x - y = 3$