

10th MATHS – GEOMETRY / GRAPH – Question Bank

Prepared By: **M.PALANIYAPPAN**, MSc. BEd, MPhil
SGHSS, NERKUPPAI. Mobile: 9942904874

GEOMETRY - Constructions

I. SIMILAR TRIANGLES :- (Big to Small)

1. Construct a triangle similar to a given triangle PQR with its sides equal to $\frac{3}{5}$ of the corresponding sides of the triangle PQR (scale factor $\frac{3}{5} < 1$)
2. Construct a triangle similar to a given triangle PQR with its sides equal to $\frac{2}{3}$ of the corresponding sides of the triangle PQR (scale factor $\frac{2}{3}$)
3. Construct a triangle similar to a given triangle LMN with its sides equal to $\frac{4}{5}$ of the corresponding sides of the triangle LMN (scale factor $\frac{4}{5}$)

II. SIMILAR TRIANGLES :- (Small to Big)

4. Construct a triangle similar to a given triangle PQR with its sides equal to $\frac{7}{4}$ of the corresponding sides of the triangle PQR (scale factor $\frac{7}{4} > 1$)
5. Construct a triangle similar to a given triangle ABC with its sides equal to $\frac{6}{5}$ of the corresponding sides of the triangle ABC (scale factor $\frac{6}{5}$)
6. Construct a triangle similar to a given triangle PQR with its sides equal to $\frac{7}{3}$ of the corresponding sides of the triangle PQR (scale factor $\frac{7}{3}$)

III. TRIANGLES :- (When MEDIAN is given)

7. Construct a ΔPQR in which $PQ = 8$ cm, $\angle R = 60^\circ$ and the median RG from R to PQ is 5.8 cm. Find the length of the altitude from R to PQ .
8. Construct a ΔPQR in which $QR = 5$ cm, $\angle P = 40^\circ$ and the median PG from P to QR is 4.4 cm. Find the length of the altitude from P to QR .

9. Construct a ΔPQR in which the base $PQ = 4.5$ cm, $\angle R = 35^\circ$ and the median from R to PQ is 6 cm.

IV. **TRIANGLES :- (When ALTITUDE is given)**

10. Construct a triangle ΔPQR such that $QR = 5$ cm, $\angle P = 30^\circ$ and the altitude from P to QR is of length 4.2 cm.
11. Construct a ΔPQR such that $QR = 6.5$ cm, $\angle P = 60^\circ$ and the altitude from P to QR is of length 4.5 cm.
12. Construct a triangle ΔABC such that $AB = 5.5$ cm, $\angle C = 25^\circ$ and the altitude from C to AB is 4 cm.

V. **TRIANGLES :- (When the point of ANGLE BISECTOR is given)**

13. Draw a triangle ABC of base $BC = 8$ cm, $\angle A = 60^\circ$ and the bisector of $\angle A$ meets BC at D such that $BD = 6$ cm.
14. Draw a triangle ABC of base $BC = 5.6$ cm, $\angle A = 40^\circ$ and the bisector of $\angle A$ meets BC at D such that $CD = 4$ cm.
15. Draw ΔPQR such that $PQ = 6.8$ cm, vertical angle 50° and the bisector of the vertical angle meets the base at D where $PD = 5.2$ cm.

VI. **TANGENTS TO A CIRCLE: (Using the Centre)**

16. Draw a circle of radius 3 cm. Take a point P on this circle and draw a tangent at P .
17. Draw a tangent at any point R on the circle of radius 3.4 cm and centre at P ?

VII. **TANGENTS TO A CIRCLE: (Using Alternate Segment Theorem)
[or Tangent Chord theorem]**

18. Draw a circle of radius 4 cm, At a point L on it draw a tangent to the circle using the alternate segment theorem.
19. Draw a circle of radius 4.5 cm. Take a point on the circle. Draw the tangent at that point using the alternate – segment theorem.

VIII. **TANGENTS TO A CIRCLE:** (Pair of Tangents or Two Tangents)

20. Draw a circle of diameter 6 cm from a point P , which is 8 cm away from its centre. Draw the two tangents PA and PB to the circle and measure their lengths.
21. Draw the two tangents from a point which is 10 cm away from the centre of a circle of radius 5 cm. Also, measure the lengths of the tangents.
22. Draw the two tangents from a point which is 5 cm away from the centre of a circle of diameter 6 cm. Also, measure the lengths of the tangents.
23. Take a point which is 11 cm away from the centre of a circle of radius 4 cm and draw the two tangents to the circle from the point.
24. Draw a tangent to the circle from the point P having radius 3.6 cm, and centre at O point P is at a distance 7.2 cm from the centre.

GRAPH

I. **NATURE of the SOLUTIONS :-** (Graphically)

Discuss the nature of solutions of the following quadratic equations:

1. $x^2 + x - 12 = 0$
2. $x^2 - 8x + 16 = 0$
3. $x^2 + 2x + 5 = 0$

Graph the following quadratic equations and state its nature of solutions:

4. $x^2 - 9x + 20 = 0$
5. $x^2 - 4x + 4 = 0$
6. $x^2 + x + 7 = 0$
7. $x^2 - 9 = 0$
8. $x^2 - 6x + 9 = 0$
9. $(2x - 3)(x + 2) = 0$

II. Solving QUADRATIC EQUATIONS :- (Through intersection of lines)

10. Draw the graph of $y = 2x^2$ and hence solve $2x^2 - x - 6 = 0$.
11. Draw the graph of $y = x^2 - 4$ and hence solve $x^2 - x - 12 = 0$.
12. Draw the graph of $y = x^2 + 4x + 3$ and hence find the roots of $x^2 + x + 1 = 0$.
13. Draw the graph of $y = x^2 + x - 2$ and hence solve $x^2 + x - 2 = 0$.
14. Draw the graph of $y = x^2 - 4x + 3$ and use it to solve $x^2 - 6x + 9 = 0$.
15. Draw the graph of $y = x^2 + x$ and hence solve $x^2 + 1 = 0$.
16. Draw the graph of $y = x^2 + x - 2$ and use it to solve $x^2 + 2x + 1 = 0$.
17. Draw the graph of $y = x^2 + 3x - 4$ and hence use it to solve $x^2 + 3x - 4 = 0$.
18. Draw the graph of $y = x^2 - 5x - 6$ and hence solve $x^2 - 5x - 14 = 0$.
19. Draw the graph of $y = 2x^2 - 3x - 5$ and hence use it to solve $2x^2 - 4x - 6 = 0$.
20. Draw the graph of $y = (x - 1)(x + 3)$ and hence use it to solve $x^2 - x - 6 = 0$

III. SPECIAL GRAPH:- (Unit-5: Co-ordinate Geometry)

21. A mobile phone is put to use when the battery power is 100%. The percent of battery power 'y' remaining after using the mobile phone for x hours is assumed as $y = -0.25x + 1$.
(Example - 5.27)
 - i) Draw a graph of the equation
 - ii) Find the number of hours elapsed if the battery power is 40%.
 - iii) How much time does it take so that the battery has no power?
22. You are downloading a song. The percent y (in decimal form) of mega bytes remaining to get downloaded in x seconds is given by $y = -0.1x + 1$. Find
 - i) graph the equation. (Exercise 5.3 - Q.No.11)
 - ii) the total MB of the song.
 - iii) after how many seconds is 75% of the song gets downloaded.
 - iv) after how many seconds the song will be downloaded completely.