MATHS

BOOKS - KUMAR PRAKASHAN KENDRA MATHS (GUJRATI ENGLISH)

CONSTRUCTIONS

EXERCISE 11.1

1. Draw a line segment of length $7.6cm$ and divide it in the ratio $5:8$ Measure the two parts.

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2. Construct a triangle of sides 4 cm, 5 cm and 6 cm and then a triangle similar to it whose sides are $\frac{2}{3}$ of the corresponding sides of the first triangle.

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

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4. Construct an isosceles triangle whose base is 8 cm and altitude 4 cm and then another triangle whose sides are $1\frac{1}{2}$ thimes the corresponding sides of the isosceles triangle.

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5. Draw a triangle ABC with side $BC = 6cm. AB = 5cm$ and $\angle ABC = 60^\circ$. Then sonstruct a triangle whose sides are $\frac{3}{4}$ of the corresponding sides of the triangle ABC

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6. Draw a triangle ABC with side $BC = 7cm, \angle B = 45^\circ, \angle A = 105^\circ$. Then, construct a triangle whose sides are $\frac{4}{3}$ times the corresponding sides of ΔABC.

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7. Draw a right trianlge in which the side (other than hypotenuse) are of length 4 cm and 3 cm. Then construct another triangle whose sides are $\frac{5}{3}$ times the corresponding sides of the given triangle.

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EXERCISE 11.2

1. Draw a circle of radius 6 cm. From a pint 10 cm away from its centre, construct the pair of tangents to the circle and measure their lengths.

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2. Construct a tangent to a circle of radius 4 cm from a point on the concentric circle of radius 6

cm and measure its length. Also verify the measurement by actual calculation.

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3. Draw a circle of radius 3 cm. Take two point P and Q on one of its extended diameter each at a distance of 7 cm from its centre. Draw tangents to the circle from these two points P and Q.

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4. Draw a pair of tangents to a circle of radius 5 cm which are incloined to each other at an angle of 60°.

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5. Draw a line segment AB of length 8 cm. Taking A as centre, draw a circle of radius 4 cm and taking B as centre, draw another circle of radius 3 cm. Construct tangents to each circle from the centre of the other circle.

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6. Let ABC be a right triangle in which $AB = 6cm, BC = 8cm$ and $\angle B = 90^\circ$(. BD is the perpendicular from B on AC. The circle through B,C,D is drawn. Construct the tangents from A to this circle.

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7. Draw a circle with the help of a bangle. Take a point outside the circle. Construct the pair of tangents from this point to the circle.

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TEST YOUR SKILLS

1. Draw a line segment AB of length AB of length $8.5cm$ and divide it internally in the ratio $2:3$.

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2. Construct a triangle of sides 3 cm, 4 cm and 5 cm. Then construct a triangle similar to it whose sides are $\frac{5}{4}$ times the correspoinding sides of the first triangle.

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3. Draw a ΔABC with $AB = 6cm, BC = 5cm$ and $\angle B = 45^\circ$. Then construct a triangle similar to ΔABC whose sides are $\frac{3}{4}$ of the corresponding sides of ΔABC.

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4. Draw a ΔABC with $AB = 6cm, BC = 4cm$ and $\angle B = 45^\circ$. Then construct a triangle similar to ΔABC whose sides are $\frac{3}{4}$ of the corresponding sides of ΔABC.

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5. Draw a ΔABC with $AB = 4cm, BC = 9cm$ and $AC = 6cm$. Then construct a triangle similar to ΔABC whose sides are $1\frac{1}{2}$ times the corresponding sides of ΔABC.

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6. Draw a circle of radius 5 cm. From a point 9 cm away from the centre, construct a pair of tangents to the circle.

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7. Draw a circle of radius 4 cm. From a point 10 cm away from the centre, construct a pair of tangents to the circle.

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8. Draw a circle with radius 4 cm and a diameter AB of the circle. Extend AB on both the sides and take one point each on both the extended parts. Draw of pair of tangnets to the circle from each of these points.

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9. Draw line segment AB of length 10 cm. Draw a circle with centre A and radius 4 cm and another circle with centre B and radius 3 cm, Construct pair of tangents to each circle from the centre of the other circle.

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PRACTICE THOROUGHLY

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

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2. Draw Δ ABC with BC = 6 cm, AB = 5 cm and $\angle B = 60^\circ$. Then, construct a triangle similar to A ABC whose sides are 3/4 of the corresponding sides of ΔABC.

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3. Determine a point which divides a line segment of length 10 cm internally in the ratio 3:4.

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4. Draw a line segment of length 8 cm and divide it internally in the ratio 4:5.

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5. Draw Δ ABC with $AB = 6cm, BC = 8cm$ and $\angle B = 90^\circ$.

Then, construct another triangle similar to Δ ABC whose sides are $\frac{3}{4}$ of the corresponding sides of Δ ABC.

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6. Construct an isosceles triangle whose base in 10 cm and altitude is 4 cm. Then, construct another triangle similar to it whose sides are $\frac{6}{5}$ times the corresponding sides of the first triangle.

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7. Draw a circle of radius 4 cm and take a point P on it. Without using the centre of the circle, draw a tangent to the circle at P.

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8. Draw two concentric circles with centre O and radii 3 cm and 5 cm. From a point on the biggercircle, draw tangents to the smaller circle.

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9. Draw a circle with centre and radius 4 cm and take a point P 7.5 cm away from the centre O. Then, from P draw a pair of tangents to the circle.

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10. Draw a segement AB of length 11 cm. Draw circles with centres A and B with radius 4 cm and 3 cm respectively. Then, draw a pair of tangents to each circle from the centre of the other circle.

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OBJECTIVE QUESTIONS

1. To draw a pair of tangents to a circle which are inclined to each other at an angle of 35°, it is required to draw tangents at the end points of two radii which are inclined to each other at an angle of .....

Answer: 145°

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2. To divide a line segment in the ratio $\sqrt{3} : \frac{1}{\sqrt{3}}$ is same as dividing it in the ratio ……..

Answer: $3:1$

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3. P is a point in the plane of a circle with centre O and radius 4 cm. If OP = 3 cm, ... tangent/s can be drawn to the circle from point P.

Answer: no

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4. The two tangents drawn to a circle at the end points of a diameter are ..... to each other.

Answer: parallel

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5. If two radit of a circle are inclined to each other at an angle of 70°, then the tangents at the end points of those radii are inclined to each other at an angle of……..

Answer: 110°

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6. To divide segment AB in the ratio 3:5, ray AX is drawn such that $\angle BAX$ is an acute angle. Then, the number of points to be marked at equal distance on AX must be at least ....

A. 3

B. 5

C. 8

D. 15

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7. To construct a triangle similar to A ABC using a scale factor $\frac{3}{7}$, BC should be divided internally in the ratio……..

A. $3:4$

B. $3:7$

C. $3:10$

D. $4:7$

Answer: C::D

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8. Point P lies on segment AB such that $\frac{AP}{AB} = \frac{2}{5}$. Then, point P divides AB internally in the ratio…….

A. $2:5$

B. $2:3$

C. $3:5$

D. $5:2$

Answer: B::C

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9. A segment AB is divided at a point P such that 7PB = 3AB. Then, the ratio AP: PB =.....

A. $4:7$

B. $7:4$

C. $7:3$

D. $4:3$

Answer: C::D

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10. To divide a line segment internally in the ratio 4:7, the number of arcs to be drawn on a ray

inclined to the line segment is .....

A. 4

B. 7

C. 11

D. 28

Answer: A

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11. To draw two tangents to a circle which are inclined at an angle of 60° the perpendiculars are

to be drawn at the ends of two radii which are inclined at an angle of .....

A. 60°

B. 120°

C. 90°

D. 75°

Answer: A::B

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12. To draw two tangents to a circle which are perpendicular to each other, the perpendiculars

are to be drawn at the ends of two radii which are inclined at an angle of……..

A. 120°

B. 60°

C. 30°

D. 90°

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13. If two tangents to a circle are inclined at an angle of 35°, the radit through the points of

contact of those tangents are inclined at an angle of .....

A. 35°

B. 55°

C. 125°

D. 145°

Answer: A::D

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14. To draw two tangents to a circle with centre O and radius 3 cm from a point P, 8 cm from O,

we draw a circle with centre at the midpoint of OP and radius ..... cm.

A. 8

B. 3

C. 5

D. 4

Answer: D

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15. If two tangents to a circle are inclined at an angle of 75°, then the radii through their points

of contact are inclined at an angle of .....

A. 15°

B. 75°

C. 105°

D. 125°

Answer: A

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16. Point P lies in the exterior of a circle with cnetre O and radius 5 cm. If $OP = 13cm,$ then what is the length of a tangnet from P to the

circle ?

Answer: 12 cm

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17. Point P lies on segment AB such that $\frac{AP}{AB} = \frac{3}{8}$. In what ratio does the point P divide AB internally ?

Answer: $3:5$

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18. If two tangents from point P to a circle are inclined to each other at a angle of 140°, at what angle will the radii from the points of contact of those tangents be inclined ?

Answer: 40°

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19. Point P lies on segment AB such that $3AB = 10AP$. In which ratio does the point P divide AB internally ?

Answer: $3:7$

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20. If a triangle is to be constructed similar to a given triangle ABC with scale factor $\frac{4}{7}$, in what ratio should BC be divided internally ?

Answer: $4:3$

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21. It is possible to divide a line segment in the ratio $\sqrt{5}:\frac{1}{\sqrt{5}}$.

Answer: True

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22. It is possible to divide a line segment in the ratio $2+\sqrt{3}:2-\sqrt{3}$.

Answer: False

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23. Check weather statement is true or False : A pair of tangents can be constructed to a circle or radius 5 cm from a point P situated at a distance of 4 cm from the centre.

Answer: False

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24. True or False: A pair of tangents can be constructed to a circle of radius 4 cm from a point P situated at a distance 8 cm from the centre.

Answer: True

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25. True or False : A pair of tangents to a circle can be constructed which are inclined at an

angle of 170°.

Answer: True

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TEXTUAL EXAMPLES

1. Construction $11.1:$ To divide a line segment in a given ratio.

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2. To construct the tangents to a circle from a point outside it.

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OTHER IMPORTANT EXAMPLES

1. Draw triangle ABC with $BC = 4cm, AC = 5cm$ and $\angle C = 120^\circ$. Then construct a triangle whose side are $\frac{4}{5}$ of the corresponding side of ΔABC.

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2. Draw a pair of tangnets to a circle with radius 4 cm which are inclined to each other at an angle of 45°.

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