MATHS

BOOKS - NAVBODH MATHS (HINGLISH)

GEOMETRIC CONSTRUCTIONS

5 1 1 Mark Each

1. $\Delta AMT \sim \Delta AHE$ and $\frac{MA}{HA} = \frac{7}{5}$ then which of the following is true ?

A. A-H-M

B. A-M-H

C. M-A-H

D. A-T-E

Answer: A

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2. $\Delta RHP \sim \Delta NED$ and $\frac{HP}{ED} = \frac{4}{5}$ then which of the foloowing is true

A. ΔRHP is a bigger triangle

B. ΔRHP is a smaller triangle

C. Both the triangles are congruent

D. Bigger or smaller triangle cannot be determined

Answer: B

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3. For the construction of a tangent to a circle without using its centre, the property used is

A. tangent segment theorem

B. inscribed angle theorem

C. tangent secant theorem

D. intersectiong chords theorem

Answer: C

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5 2 1 Mark Each

1. Draw seg AB of length 4.2 cm. Construct its perpendicular bisector.

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2. Draw $\angle ABC = 115^\circ$, construct its bisector

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3. To devide a given line segment in a given ratio :

Draw seg PQ of length 7 cm. Divide it in the ratio 3 : 2

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5 3 2 Marks Each

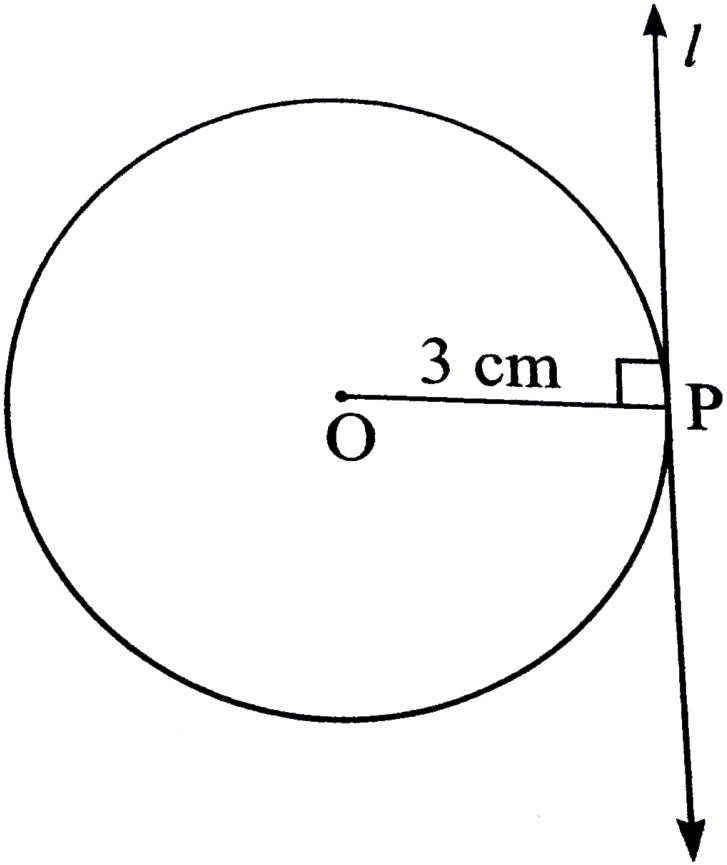
1. Draw a circle of radius 3 cm. Mark a point P on the circle. Draw tangent to the circle through point P using the centre of the circle Analysis

A circle of radius 3 cm can be drawn. Let the cemntre of the given circle be O and line l be the required tangent

We know, converse of tangent theorem states that , 'A line perpendicular to radius at its outer end is tangent .

$\therefore$ We construct perpendicular to radius OP at point, then line l is the

required tangent .



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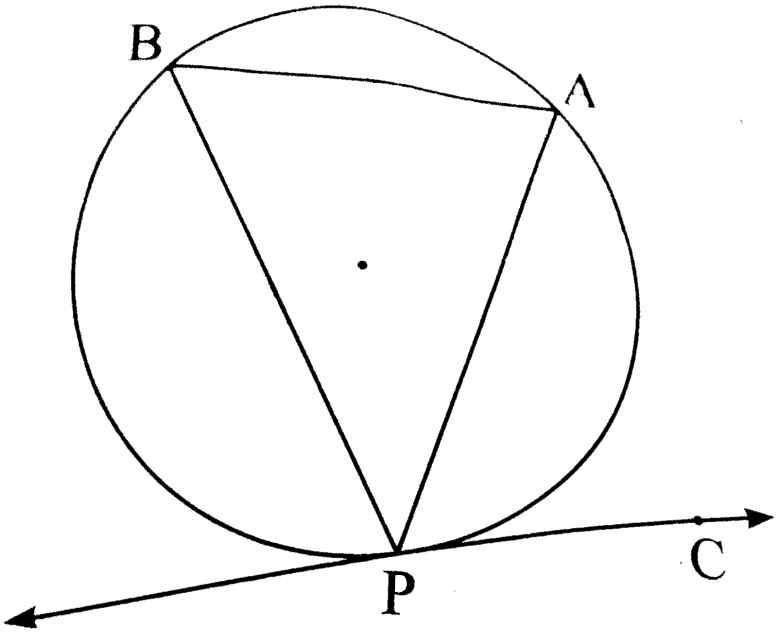
2. Draw a circle of radius 3 cm. Take any point P on it. Draw tangent to the circle through point P without using the centre of the circle

Analysis :

Through P, a chord can be drawn. Let it be PA. Draw any $\angle PBA$ in the alternate segment. Now and $\angle aPC$ can be constructed congrument to $\angle ABP$, then by converse of tangent secant angle theorem line PC is the required tangent.



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5 4 3 Marks Each

1. Draw a cirle with centre P. Draw an are AB of 100° measure

Draw tangent to the circle at point A and B

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2. Draw a circle of radius 3.3 cm. Draw diameter PQ. Draw tangents at P and Q. Write observation about the tangents.

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3. Draw a circle with radiuys 3.4 cm. Draw a chord MN of length 5.7 cm in it. Construct tangents at point M and N to the circle

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4. Draw a circle of radius 4.2 cm and centre O. Mark a point P at a distance of 7 cm from the centre. Draw tangents to the circle from Points P. (March '19)

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5 5 4 Marks Each

1. $\Delta ABC \sim \Delta LMN$. In ΔABC, $AB = 5.5cm$, BC = 6 cm, CA = 4.5 cm. If MN = 4.8 cm then construct ΔABC and ΔLMN

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2. $\triangle PQR \sim \triangle PMN$. In $\triangle PQR$, $PQ =$ 4 cm , QR = 5 cm and PR = 6 cm.

Construct $\triangle PQR$ and $\triangle PMN$ such that $\frac{PR}{PN} = \frac{5}{3}$

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Assigment 5 1

1. The number of tangents that can be drawn to a circle at a point on the circle is

A. 3

B. 2

C. 1

D. infinite

Answer: C

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2. The maximum number of tangents that can be drawn to a circle from a point outside it is.....

A. 2

B. 1

C. one and only one

D. 0

Answer: A

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3. If AD and PS are medians of $\triangle ABC$ and $\triangle PQR$ respectively where $\triangle ABC \sim \triangle PQR$, Prove that $\frac{AB}{PQ} = \frac{AD}{PS}$.

A. $\triangle ABC$ is bigger

B. $\triangle PQR$ is bigger

C. Both triangles will be equal

D. cannot be decided

Answer: A

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Assigment 5 2

1. Draw seg AB of length 5.1 cm. Draw its perpendicular bisector

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2. Draw AB = 9.7 cm. Take a point P on it such that A - P - B and AP = 3.5 cm. Through P draw a line perpendicular to seg AB.

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3. Draw segment AB of length 4 cm. Divide it in ratio 2 : 3

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4. Draw $\angle PQR = 125^\circ$. Construct its bisector

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Assigment 5 3

1. Construct tangent to a circle with centre A and radius 3.4 cm at any point P on it.

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2. Draw any circle. Take any point on it and construct tangent at A without using the centre of the circle.

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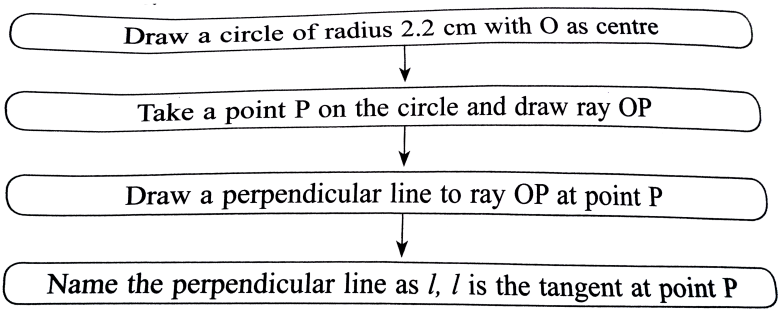
3. Complete the following activity to draw a tangent to a circle at a point on the circle



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Assigment 5 4

1. Draw a circle of radius 2.7 cm and draw chord PQ of length 4.5 cm. Draw tangents at point P and Q without using the centre

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2. Draw a circle with centre P and radius 3.1 cm. Draw a chord MN of length 3.8 cm. Draw tangents to the circle through points M and N.

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3. Draw a circle with radius 3.2 cm. Construct tangents to the circle from a point at a distance of 6 cm from the centre

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Assigment 5 5

1. $\triangle XYZ \sim \triangle PYR$. In $\triangle XYZ, \angle Y = 60^\circ$, XY = 4.5 cm and YZ = 5.1 cm and $\frac{XY}{PY} = \frac{4}{7}$ then construct $\triangle XYZ$ and $\triangle PYR$

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2. Draw a circle of radius 3.4 cm and centre E.

Take a point F on the circle.Take another point A such that E-F-A and FA=4.1 cm.

Draw tangents to the circle from point A.

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3. $\triangle RST \sim \triangle UAY$. In $\triangle RST$, RS = 6 cm, $\angle S = 50^\circ$, sT = 7.5 cm , $\frac{RS}{UA} = \frac{5}{4}$. Construct $\triangle RST$ and $\triangle UAY$.

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4. Construct $\triangle PYQ$ such that, PY=6.3 cm, YQ=7.2cm, PQ=5.8cm.If $\frac{YZ}{YQ} = \frac{6}{5}$, then construct $\triangle XYZ$ similar to $\triangle PYQ$.

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5. Draw a sector, whose arc has angular measure 60° and radius 6 cm. Draw a circle touching the sides of the sector and the arc.

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Examples For Practice

1. Construct tangent to a circle with centre A and radius 3.4 cm at any point P on it.

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2. Draw a circle of radius 2.6 cm. Draw a tangent to the circle from any point on the circle.

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3. Draw a circle of radius 4.2 cm. Take any point K on it. Draw a tangent to the circle without using centre of the circle.

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4. Draw a circle with centre P and radius 3.1 cm. Draw a chord MN of length 3.8 cm. Draw tangents to the circle through points M and N.

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5. Draw a circle with radius 4.2 cm . Construct tangents to the circle from a point at a distance of 7 cm from the centre .

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6. $\triangle ABC \sim \triangle PQR$, in $\triangle ABC$, AB=3.6 cm, BC= 4cm and AC=4.2 cm. The corresponding sides of $\triangle ABC$ and $\triangle PQR$ are in the ratio 2 :

3. Construct $\triangle ABC$ and $\triangle PQR$.

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7. $\triangle RKN \sim \triangle SPV$. In $\triangle RKN, RK = 6.4cm$, $\angle R = 60^\circ, \angle K = 50^\circ$ and $\frac{RN}{SV} = \frac{4}{3}$ then construct $\triangle RKN$ and $\triangle SPV$.

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8. $\triangle PSE \sim \triangle TSV$. In $\triangle PSE, PS = 4.4cm$, SE=5.1cm,PE=5.5cm and $\frac{PS}{TS} = \frac{5}{3}$.

Construct $\triangle PSE$ and $\triangle TSV$.

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9. $\triangle AMT \sim \triangle AHE$. In $\triangle AMT, MA = 6.3cm, \angle MAT = 120^\circ, AT = 4.9cm$ and $\frac{MA}{HA} = \frac{7}{5}$,

Construct $\triangle AMT$ and $\triangle AHE$.

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10. In ΔSHR, $SH = 4.5cm$, $HR = 5.2cm$, $SR = 5.8cm$ and $\frac{SH}{SV} = \frac{3}{5}$ construct ΔSVU. $\Delta SHR \sim \Delta SVU$.

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11. Two different points P and Q are given on one side of line AB. Draw a circle passing through the points P and Q touching the line AB in point R.

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12. Draw $\angle ABC = 50^\circ$. Take a point S in the interior of $\angle ABC$. Draw a circle passing through point S and touching the sides of $\angle ABC$.

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Example

1. (B) Solve any two of the following subquestions :

$\Delta XYZ \sim \Delta DEF$, XY = 5.1 cm , Y Z = = 3.9 cm, XZ = 6 cm, XY : DE = 3: 2,

Construct ΔXYZ and ΔDEF.

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2. $\triangle PQR \sim \triangle PMN$. In $\triangle PQR$, , PQ=4cm, QR=5cm, and PR=6cm. Construct $\triangle PQR$ and $\triangle PMN$ such that $\frac{PR}{PN} = \frac{5}{3}$.

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3. $\triangle PQR \sim \triangle PMN$. In $\triangle PQR$, , PQ=4cm, QR=5cm, and PR=6cm. Construct $\triangle PQR$ and $\triangle PMN$ such that $\frac{PR}{PN} = \frac{3}{5}$.

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Lets Revise Certain Constructions Studied In The Previous Standards

1. Draw seg AB of length 4.2 cm. Construct its perpendicular bisector.

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2. Draw $\angle ABC = 115^\circ$, construct its bisector

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3. To construct perpendicular to a line from a point P outside it.

Question : Draw line KL such that KL=4.5 cm.

Consider point outside it. Through P, draw a line perpendicular to line KL.

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4. To construct an angle congruent to the given angle.

Question : Construct $\angle PQR$ congruent to given $\angle LMN$.

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5. To construct a line parallel to a given line and passing through a given point outside the line.

Question : Draw a line l, take a point P outside it. Draw a line m || line l passing through point P.

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6. To divide a given line segment into given number of equal parts.

Question : Draw segment PQ of length 5 cm. Divide it into 4 equal parts.

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7. To divide a line segment in the given ratio.

Question : Draw segment PQ of length 5 cm. Divide it in the ratio 3:2.

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8. To construct a triangle whose sides are given. Question : Construct $\triangle ABC$ such that AB=4.2 cm, BC=5.3 cm and AC=3.7 cm.

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Practice Set 4 1

1. $\Delta ABC \sim \Delta LMN$. In ΔABC, $AB = 5.5cm$, BC = 6 cm, CA = 4.5 cm. If MN = 4.8 cm then construct ΔABC and ΔLMN

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2. In $\triangle PQR$,PQ=4.2cm,QR=5.4cm,PR=4.8cm.Construct $\triangle PQR \sim \triangle LTR.$ such that $\frac{PQ}{LT} = \frac{3}{4}$.

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3. In $\triangle RST, RS = 4.5cm, \angle RST = 40^\circ, ST = 5.7cm.$ Construct $\triangle RST \sim \triangle XYZ.$ such that $\frac{RS}{XY} = \frac{3}{5}$.

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4. In $\triangle AMT, AM = 6.3cm, \angle TAM = 50^\circ, AT = 5.6cm.$ $\frac{AM}{AH} = \frac{7}{5}$. $\triangle AMT \sim \triangle AHE.$

Construct $\triangle AHE.$

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Practice Set 4 2

1. Construct a tangent to a circle with centre P and radius 3,2 cm at any point M on it.

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2. Draw a circle of radius 2.7 cm. Draw a tangent to the circle at any point on it.

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3. Draw a circle of radius 3.6 cm. Draw a tangent to the circle at any point on it without using the centre.

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4. Draw a circle of radius 3.3 cm. Draw diameter PQ. Draw tangents at P and Q. Write observation about the tangents.

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5. Draw a circle with radiuys 3.4 cm. Draw a chord MN of length 5.7 cm in it. Construct tangents at point M and N to the circle

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6. Draw a circle with centre P and radius 3.4 cm.Take a point Q at a distance 5.5 cm from the centre.Construct tangents to the circle from point Q.

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7. Draw a circle with radius 4.1 cm. Construct tangents to the circle from a point at a distance 7.3 cm from the centre.

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Problem Set 4

1. The number of tangents that can be drawn to a circle at a point on the circle is

A. 3

B. 2

C. 1

D. 0

Answer: C

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2. The maximum number of tangents that can be drawn to a circle from a point outside it is.....

A. 2

B. 1

C. One and only one

D. 0

Answer: A

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3. If $\triangle ABC \sim \triangle PQR$ and $\frac{AB}{PQ} = \frac{7}{5}$, then.....

A. $\triangle ABC$ is bigger

B. $\triangle PQR$ is bigger

C. Both triangles will be equal

D. Cannot be decided

Answer: A

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4. Draw a circle with centre O and radius 3.5 cm. Take a point P at a distance 5.7 cm from the centre. Draw tangents to the circle from point P.

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5. Draw any circle. Take any point A on it and construct tangents at A without using the centre of the circle.

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6. Draw a circle of diameter 6.4 cm. Take a point R at a distance equal to its diameter from the centre. Draw tangents from point R.

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7. Draw a circle with centre P. Draw an arc AB of 100° measure. Draw tangents to the circle at point A and B.

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8. Draw a circle of radius 3.4 cm and centre E.

Take a point F on the circle.Take another point A such that E-F-A and FA=4.1 cm.

Draw tangents to the circle from point A.

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9. $\triangle ABC \sim \triangle LBN$.In $\triangle ABC, AB = 5.1cm, \angle B = 40^\circ, BC = 4.8cm, \frac{AC}{LN} = \frac{4}{7}$ .Construct $\triangle ABC$ and $\triangle LBN$.

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10. Construct $\triangle PYQ$ such that, PY=6.3 cm, YQ=7.2cm, PQ=5.8cm.If $\frac{YZ}{YQ} = \frac{6}{5}$, then construct $\triangle XYZ$ similar to $\triangle PYQ$.

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Challenging Question

1. Construct a right angled triangle with hypotenuse $\sqrt{13}cm$. Draw a circumcircle of this triangle.

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2. Draw a circle with centre O and radius 3.2 cm. Take a points A and B on the circle Such that $\angle AOB = 60^\circ$. Let the bisector of $\angle AOB$ intersect the circle in point K. Draw a circle passing through K such that ray OA and ray OB are tangents to it.

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3. Construct $\triangle XYZ$ such that YZ=5 cm, XY+XZ=6.8 cm and $\angle XYZ = 35^\circ$. $\triangle XPQ \sim \triangle XYZ$ such that $\frac{XP}{XY} = \frac{7}{5}$. Construct $\triangle XPQ$.

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4. Draw $\triangle ABC$ such that, AB=8cm,BC=6cm and $\angle B = 90^\circ$. Draw seg BD perpendicular to hypotenuse AC. Draw a circle passing through points B,D,A. Show that line CB is tangent of the circle.

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