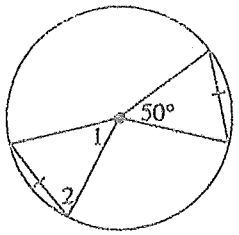
Pm 9

Key

Angles in a Circle

Find the measure of each indicated angle.

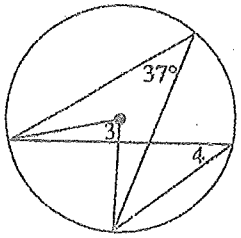
1)



$\angle 1 =$ 50°

$\angle 2 =$ 65°

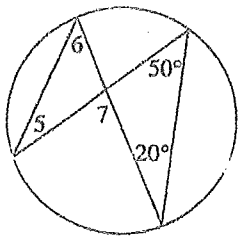
2)



$\angle 3 =$ 74°

$\angle 4 =$ 37°

3)

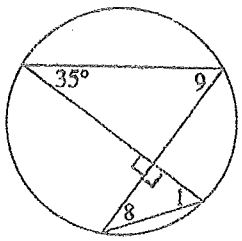


$\angle 5 =$ 20°

$\angle 6 =$ 50°

$\angle 7 =$ 70°

4)

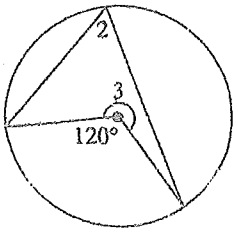


$\angle 8 =$ 35°

$\angle 9 =$ 55°

$\angle 1 =$ 55°

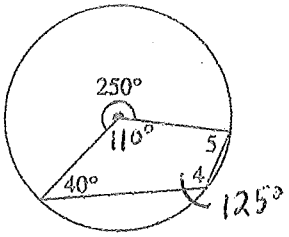
5)



$\angle 2 =$ 60°

$\angle 3 =$ 240°

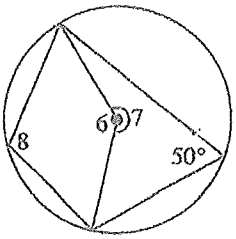
6)



$\angle 4 =$ 125°

$\angle 5 =$ 85°

7)

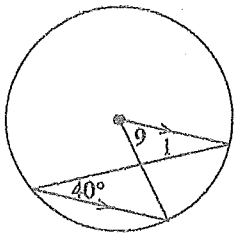


$\angle 6 =$ 100°

$\angle 7 =$ 260°

$\angle 8 =$ 130°

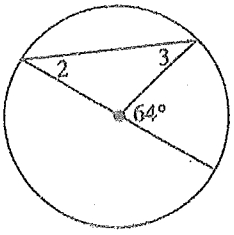
8)



$\angle 9 =$ 80°

$\angle 1 =$ 40°

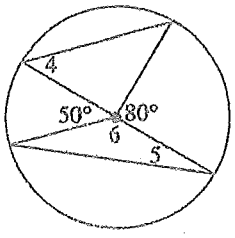
9)



$\angle 2 =$ 32°

$\angle 3 =$ 32°

10)

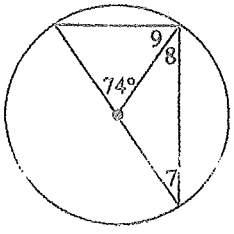


$\angle 4 =$ 40°

$\angle 5 =$ 25°

$\angle 6 =$ 130°

11)



$\angle 7 =$ 37°

$\angle 8 =$ 37°

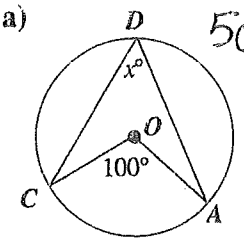
$\angle 9 =$ 53°

Pm 9 key p. 1

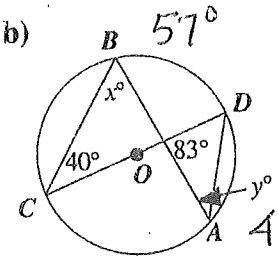
Angles in a Circle

Assignment 2

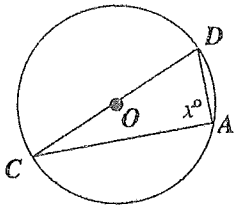
1) Find the value of the missing variables.

a) 

50°

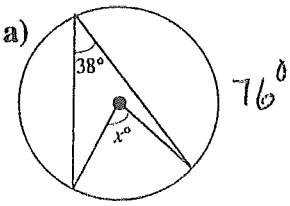
b) 

40°

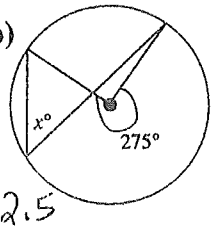
c) 

90°

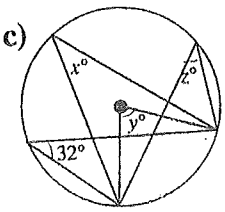
2) Find the value of the variables. The centre of each circle is marked with a solid point.

a) 

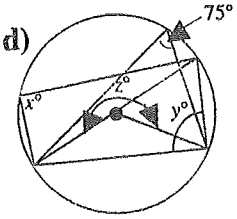
76°

b) 

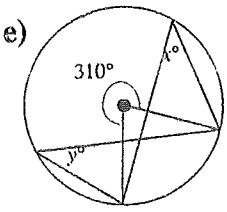
42.5

c) 

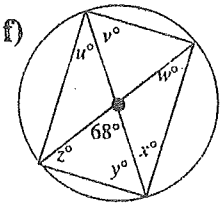
$x = 32°$
$y = 64°$
$z = 32°$

d) 

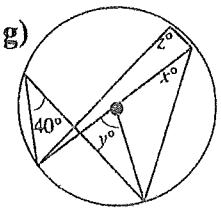
$x = 90°$
$y = 90°$
$z = 210°$

e) 

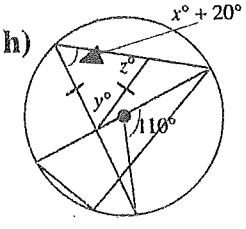
$x = y = 75°$

f) 

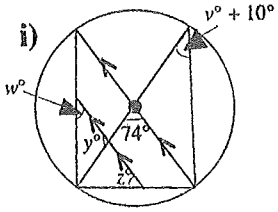
$x = w = u = 34°$
$z = y = v = 56°$

g) 

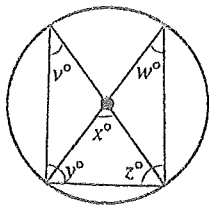
$x = 40$
$y = 80$
$z = 90°$

h) 

$x = 35°$
$y = 110°$
$z = 35°$

i) 

3) The solid point is the centre of the circle shown. Of the following relationships, the one which is false is



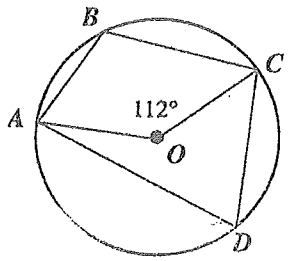
A. $v = w$

B. $v = \frac{1}{2}x$

C. $v + w = x$

D. $y = z = 2v$

4) In the diagram O is the centre of the circle. If $\angle AOC$ is 112°, then $\angle ABC$ is



A. 90°

B. 124°

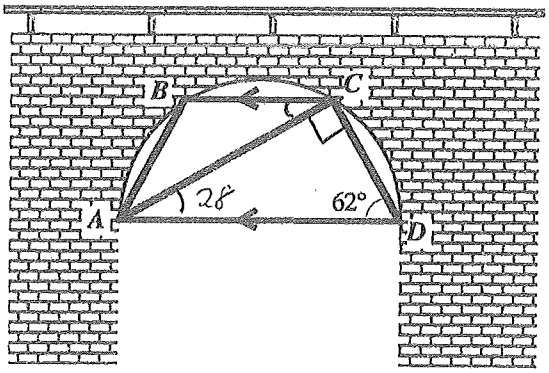
C. 137°

D. 248°

5) The sketch shows a tunnel with a steel frame bolted underneath it to give it more support.

A, B, C, and D represent the points at which the frame is bolted. The arch of the tunnel of the bridge is a semi-circle, with AD as the diameter.

The size of $\angle ACB$ is



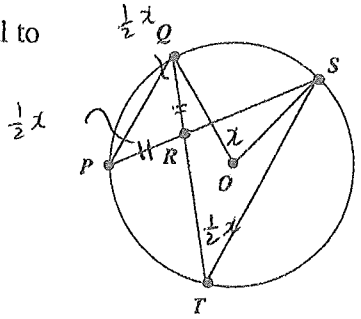
(A.) 28°

B. 31°

C. 34°

D. 42°

6) In the diagram $PR = QR$. If $\angle QOS = x°$, then $\angle PRQ$ is equal to



A. $2x°$

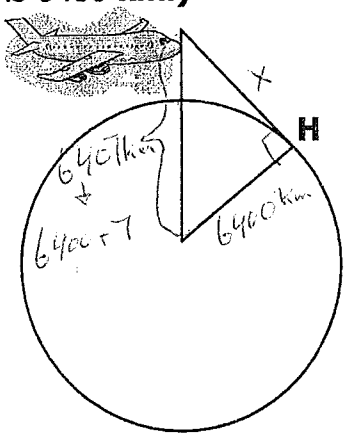
B. $180° - \frac{1}{2}x°$

(C.) $180° - x°$

D. $180° - 2x°$

Pm 9 Chapter 9 Project Name: KEY

An airplane is flying at an altitude of 7000 **m**. A passenger wonders how far he is from a point on the horizon H from that point. (The approximate radius of the Earth is 6400 **km.**)



7km

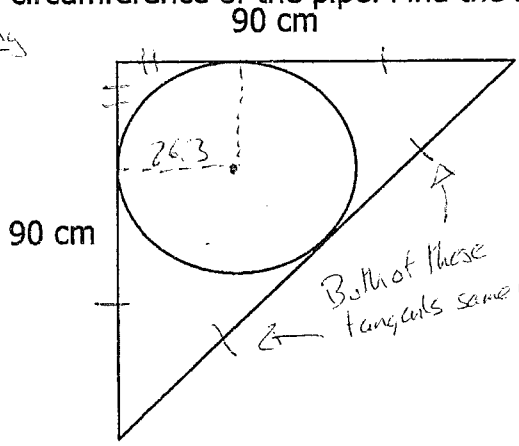
$x^2 + 6400^2 = 6407^2$

$x^2 = 89649$

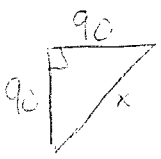
$x = 299.4$ km

The airplane is 299.4km from the horizon.

A cylindrical pipe touches a wall and the ceiling of a room. The pipe is supported by a brace. The ends of the brace are 90 cm from the wall and the ceiling. Find the circumference of the pipe. Find the radius first

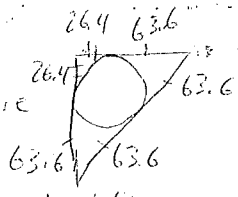


wall ceiling



$90^2 + 90^2 = x^2$

$x = 127.3$ cm



$\therefore \frac{1}{2}x = 63.6$ so lengths are

r is the tangent length in top left

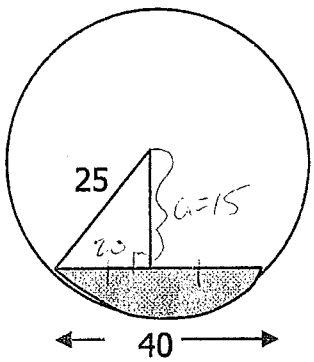
$C = 2\pi r$

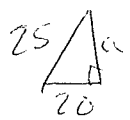
$C = 2\pi(26.4)$

$C = 165.8$ cm

The circumference of the pipe is 165.8cm

A cylindrical pipe has a radius of 25 cm. Water has collected in the bottom of the pipe. The surface length of the water is 40 cm. Find the maximum depth of the water





$a^2 + 20^2 = 25^2$

$a^2 + 400 = 625$

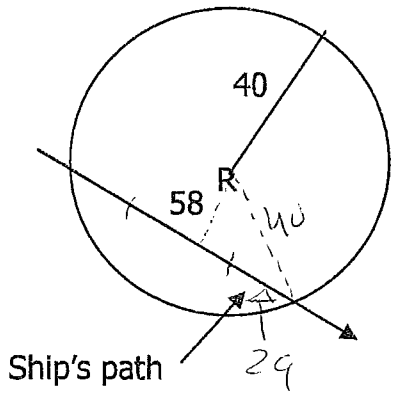
$a^2 = 225$

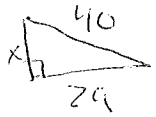
$a = 15$

If $a = 15$, and the radius = 25, the depth of the water is $25 - 15 = 10$cm.

The maximum water depth is 10cm

A radar station R tracks all ships in a circle with radius 40 km. A ship enters this radar zone and the station tracks it for 58 km until the ship passes out of range. What is the closest distance the ship comes to the radar station?





$x^2 + 29^2 = 40^2$

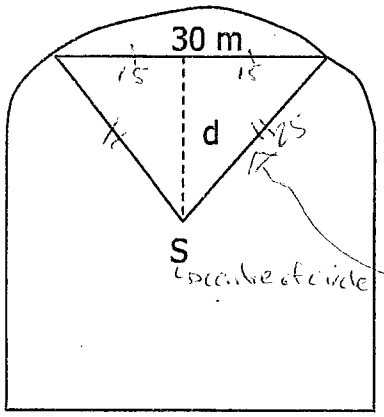
$x^2 + 841 = 1600$

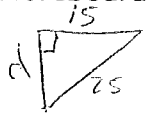
$x^2 = 759$

$x = 27.5$ km

The closest the ship comes to the radar station is 27.5 km.

An arena is 50 m wide. It has a roof with a semi-circular cross section. The scoreboard S is suspended at the centre of the semicircle by wires attached to the ends of 30 m horizontal beam. How far is the scoreboard from the beam?





$d^2 + 15^2 = 25^2$

$d^2 + 225 = 625$

$d^2 = 400$

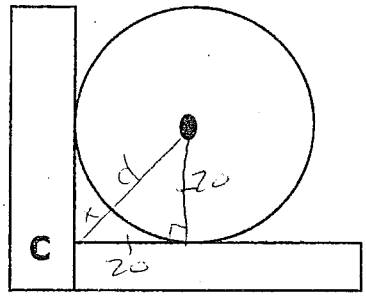
$d = 20$

The scoreboard is 20m from the beam.

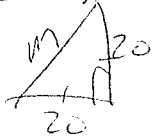
This is diameter, ∴ radius is 25m

A circular plate, with a diameter of 40 cm, touches two sides of the shelf. How far is the center of the plate from the corner C?

∴ radius is 20cm



distance from center of plate to corner is x + d. The total length we will call m. If d is the radius, we know it should be longer than 20cm



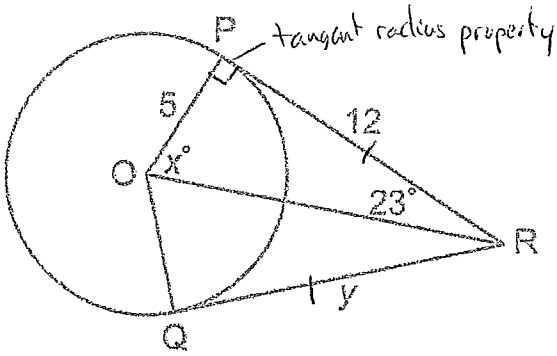
$20^2 + 20^2 = m^2$

$400 + 400 = m^2$

$28.3 = m$

The center of the plate is 28.3cm from the corner of the shelf.

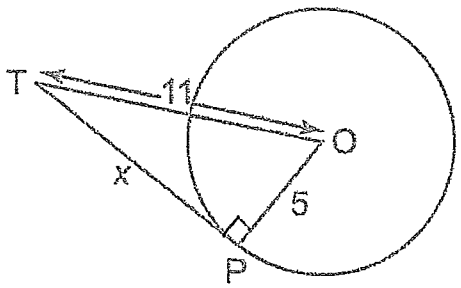
Pm 9 Chapter 9 Review 1 Name:_____

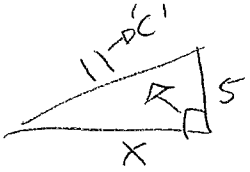
1) 

tangent radius property

$\angle x = 180 - 90 - 23 = 67°$ (6 is in a $\triangle$)

$y = 12$ (distance from external pt to tangent is =)

2) 



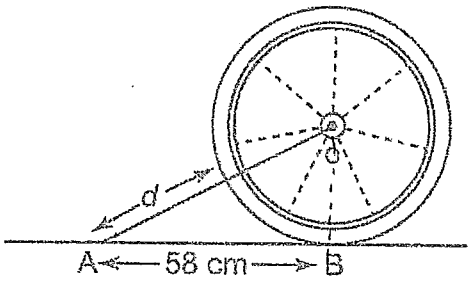
$x = x^2 + 5^2 = 11^2$

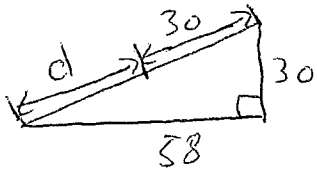
$x^2 = 121 - 25$

$x^2 = 96$

$x = 9.8$

3) A wheel has radius 30 cm. It rolls along the ground toward a tack that is 58 cm from the point where the wheel currently touches the ground. What is the distance, *d*, between the tack and the closest point on the circumference of the wheel? Give the answer to the nearest tenth of a centimetre.





$30^2 + 58^2 = c^2$

$900 + 3364 = c^2$

$4264 = c^2$

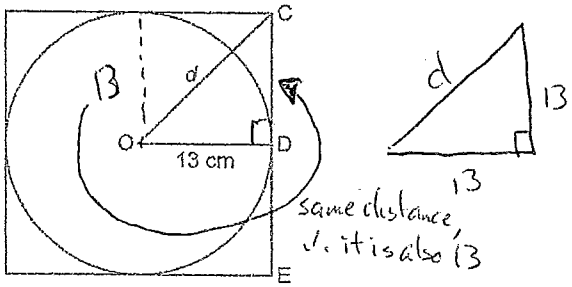
$65.3 = c$

$c = 30 + d$

$65.3 = 30 + d$

$35.3 = d$

4) A circular plate has radius 13 cm. It is packed in a square cardboard frame whose 4 edges just touch the plate. What is the distance, *d*, from the centre of the plate to a corner of the frame? Give the answer to the nearest tenth of a centimetre.



same distance, ∴ it is also 13

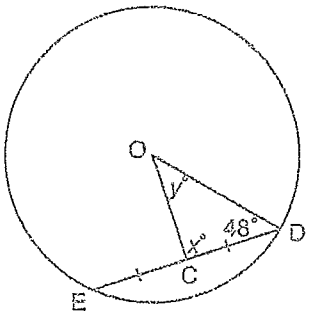
$13^2 + 13^2 = d^2$

$169 + 169 = d^2$

$338 = d^2$

$18.4 = d$

5) Point O is the centre of the circle. Determine the values of $x°$ and $y°$.

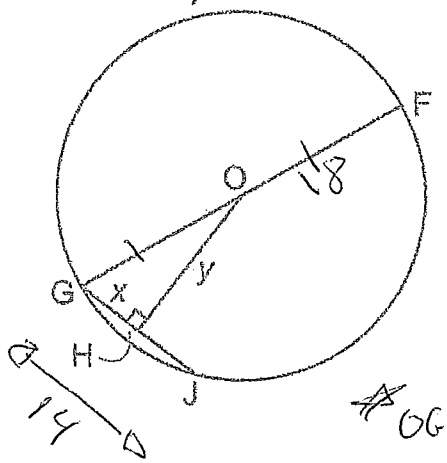


$\angle x = 90°$ (line from centre bisects chord)

$\angle y = 180° - 90 - 48°$

$= 42°$ ($\angle$s in a $\triangle$)

6) Point O is the centre of the circle; OF = 18 cm; and GJ = 14 cm. Determine the values of x and y to the nearest tenth of a centimetre where necessary.

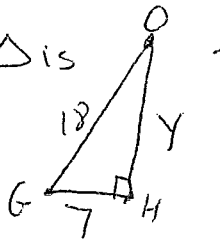


$x = \frac{1}{2} GJ$

$= \frac{1}{2} \times 14$

$= 7$ cm

$\therefore \triangle$ is



$7^2 + y^2 = 18^2$

$49 + y^2 = 324$

$y^2 = 275$

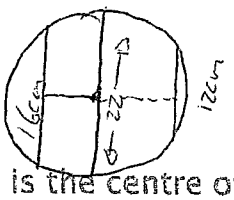
$y = 16.6$ cm

OG = OF

7) A circle has diameter 22 cm. Two chords are drawn on opposite sides of the centre of the circle. One chord is 16 cm long and the other chord is 12 cm long.

a) Which chord is closer to the centre of the circle?

b) How much closer to the centre is this chord?

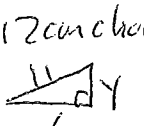


16cm chord

$x^2 + 8^2 = 11^2$

$x = 7.55$

12cm chord



$6^2 + y^2 = 11^2$

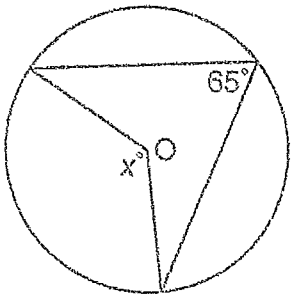
$y = 9.22$

Difference is $9.22 - 7.55 = 1.67$

$\therefore$ the 16cm chord is 1.67 cm closer to centre

8) Point O is the centre of each circle. Determine the values of $x°$ and $y°$. Justify your solutions.

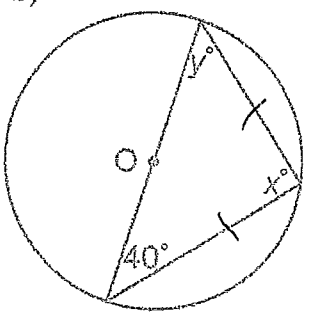
a)



$\angle x = 130$

(central $\angle$ is twice inscribed $\angle$)

b)

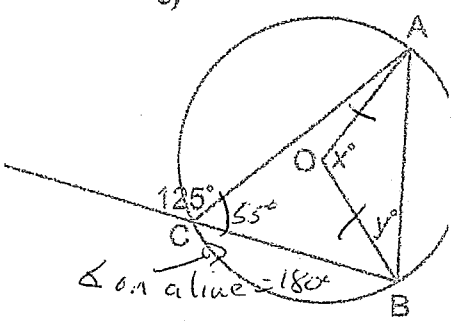


$\angle y = 40°$ (isosceles $\triangle$)

$\angle x = 180 - 40 - 40 = 100°$

($\angle$s in a $\triangle$)

c)

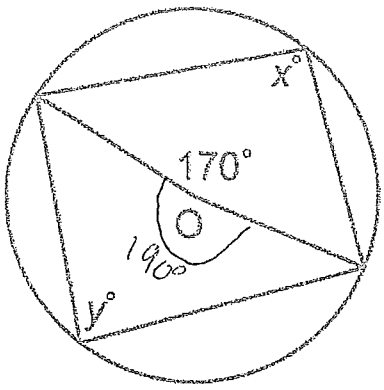


$\angle$s on a line $= 180°$

$\angle x = 110°$ (central is twice inscribed $\angle$)

$\angle y = \frac{180 - 110}{2} = 35°$ (isosceles $\triangle$)

9)



$\angle x = 95°$ (inscribed is ½ central ∠)

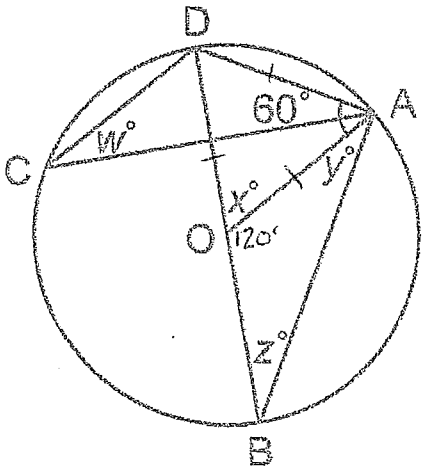
$\angle y = 85°$ (inscribed is ½ central ∠)

or

Cyclic quadrilateral

↳ opposite ∠s add to 180

10)



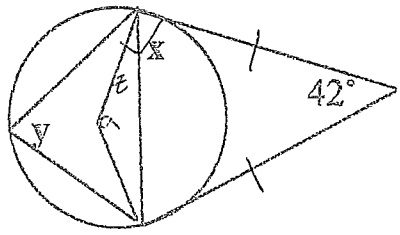
$\angle x = 60°$

$\angle y = 30°$

$\angle z = 30°$

$\angle w = 30°$

11)



$\angle x = \frac{180° - 42°}{2}$

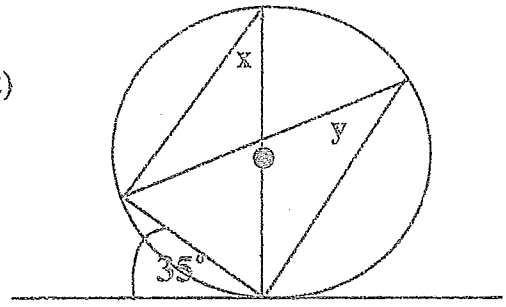
$= 69°$ (isosceles △)

$\angle z = 90 - 69° = 21°$ (tangent-property

$\angle a = 180 - 21° - 21° = 138°$

$\angle y = 69°$ (½ central ∠)

12)



$\angle x = 35°$

$\angle y = 35°$