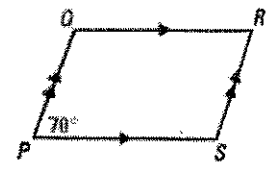


1) Given PQRS is a parallelogram, find the measure of angle  $\angle PSR$ . Explain how you know.

$m\angle PSR + m\angle QPS = 180$  b/c they are same side interior angles  $m\angle PSR = 110^\circ$



If a quadrilateral is a parallelogram, then	Correct?
Each diagonal divides the parallelogram into two congruent triangles	<input checked="" type="radio"/> T or <input type="radio"/> F
Opposite angles are congruent	<input checked="" type="radio"/> T or <input type="radio"/> F
Consecutive angles are supplementary	<input checked="" type="radio"/> T or <input type="radio"/> F
The diagonals are congruent	<input type="radio"/> T or <input checked="" type="radio"/> F
The diagonals bisect each other	<input checked="" type="radio"/> T or <input type="radio"/> F
The diagonals are perpendicular	<input type="radio"/> T or <input checked="" type="radio"/> F

3) Use the word bank to fill in the following blanks. You will not use all of the words and you may use words more than once.

**Word Bank:**

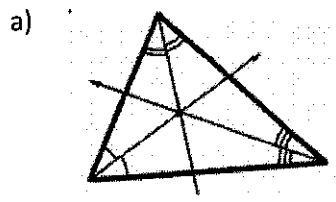
Incenter	Circumcenter	Centroid	Vertex
Side	Gravity	Medians	Perpendicular Bisectors
Circumscribed	Inscribed	Angle Bisectors	Triangle

a) The angle bisectors of a triangle intersect at the Incenter. This point is equidistant to each sides of the triangle, and is the center of a(n) inscribed circle.

b) Perpendicular bisectors meet at the Circumcenter. This point is equidistant to each vertices of the triangle, and is the center of a Circumscribed circle.

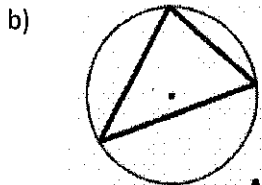
c) The point of concurrency for the medians of a triangle is called the Centroid. It is the center of Gravity for a triangle. It divides the Medians into two segments whose lengths are in a ratio of 2:1.

4) Name the type of center of the triangle shown in the diagrams below. Explain how you know.



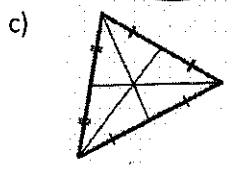
a) Name: Incenter Explanation: This is the intersection of all the angle bisectors. That point is the same distance from each side

# Honors Key



Name: **Circumcenter**

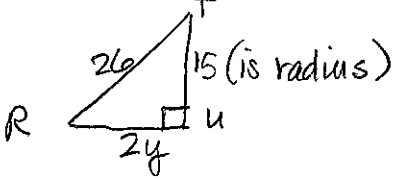
Explanation: It is the center of circles that is circumscribed around the triangle



Name: **Centroid**

Explanation: It is the intersection of all the medians

5) Point T is the incenter of  $\Delta PQR$ .  
If  $UR = 2y$ , find  $y$ . Show your work or explain your reasoning.



$$a^2 + b^2 = c^2$$

$$(2y)^2 + 15^2 = 26^2$$

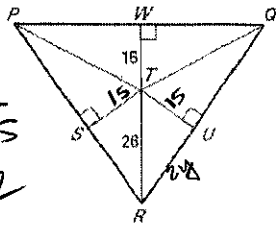
$$4y^2 + 225 = 676$$

$$4y^2 = 451$$

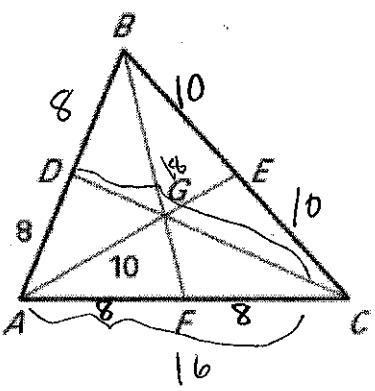
$$y^2 = 112.75$$

$$y = \sqrt{112.75}$$

$$y \approx 10.62$$

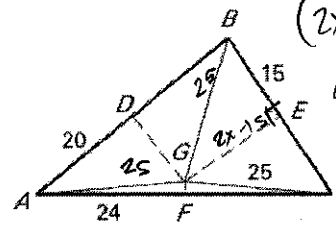


6) Point G is the centroid of  $\Delta ABC$ .  
If  $AD=8$ ,  $AG=10$ ,  $BE=10$ ,  $CD=18$  and  $AC=16$ , find the length of each segment. Show your work or explain your reasoning.



- DB = 8
- CG = 12
- GE = 5
- BC = 20
- EA = 15
- BA = 16
- GD = 6
- AF = 8

7) Point G is the circumcenter of  $\Delta ABC$ .  
If  $GE = 2x - 15$ , find  $x$ . Show your work or explain your reasoning.



$$a^2 + b^2 = c^2$$

$$(2x - 15)^2 + 15^2 = 25^2$$

$$4x^2 - 60x + 225 + 225 = 625$$

$$4x^2 - 60x + 450 = 625$$

$$4x^2 - 60x - 175 = 0$$

$$a = 4$$

$$b = -60$$

$$c = -175$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$X = \frac{60 \pm \sqrt{(-60)^2 - 4(4)(-175)}}{8}$$

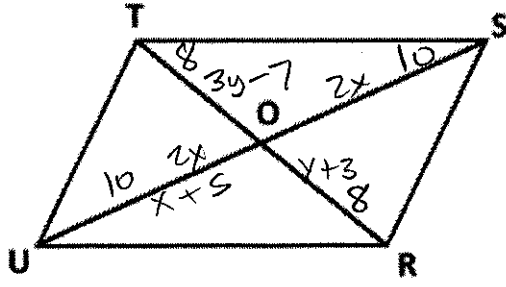
$$X = 7.5 \pm \frac{\sqrt{3600 + 2800}}{8}$$

$$X = 7.5 \pm \frac{80}{8}$$

$$X = 7.5 \pm 10$$

$$X = -2.5 \text{ or } X = 17.5$$

8) RSTU is a parallelogram.  $RO = y + 3$ ;  $SU = 4x$ ;  $TO = 3y - 7$ ;  $UO = x + 5$ . Find  $x$  and  $y$ . Show your work or explain your reasoning.



$$TO = RO$$

$$3y - 7 = y + 3$$

$$-y \quad -y$$

$$2y - 7 = 3$$

$$+7 \quad +7$$

$$2y = 10$$

$$\boxed{y = 5}$$

$$2x = x + 5$$

$$\boxed{x = 5}$$

$$(2x + 5)(2x - 35) = 0$$

Factorable!

Write the formula for each.

p. 3

a) Area of a circle =  $\pi r^2$

b) Circumference of a circle =  $2\pi r$

10) Complete the Ratio statements for each of the following:

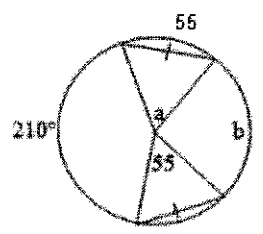
a) Ratio for finding Sector Area:  $\frac{\text{Sector Area}}{\pi r^2} = \frac{\theta}{360}$

b) Ratio for finding Length of an Arc:  $\frac{\text{Arc Length}}{2\pi r} = \frac{\theta}{360}$

c) Ratio for a Central Angle in Degrees:  $\frac{\theta}{360}$

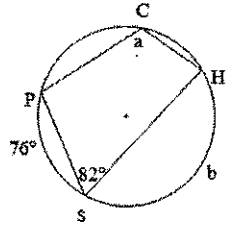
d) Ratio for a Central Angle in Radians:  $\frac{\theta}{2\pi}$

11) a) Find the measure of angle a and arc b. b) Find the measure of angle a and arc b.



a = 55°

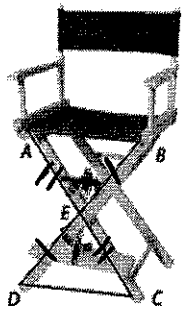
b = 40°



a = 98°

b = 120°

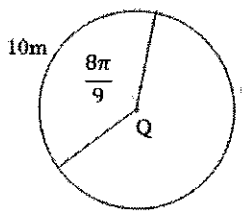
12) When assembling a chair like that shown here, the legs of the chair,  $\overline{DB}$  and  $\overline{AC}$ , are connected at their midpoints. (E is the midpoint of  $\overline{AC}$  and  $\overline{DB}$ .) Prove that  $\triangle ABE \cong \triangle CDE$ .



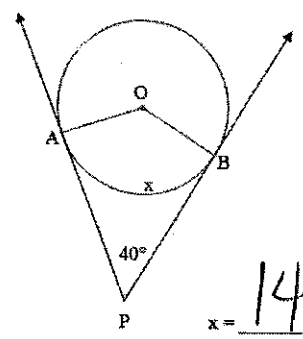
- |   |                       |
|---|-----------------------|
| 1. E is the midpoint of $\overline{AC}$ and $\overline{DB}$ | 1. Given              |
| 2. $m\overline{AC} = m\overline{DB}$                        | 2. Def. of midpoint   |
| 3. $\overline{AC} \cong \overline{DB}$                      | 3. Def. of congruence |
| 4. $\angle AEB \cong \angle CED$                            | 4. Vertical Angles    |
| 5. $\triangle ABE \cong \triangle CDE$                      | 5. SAS                |

13) a) Find the radius.

$r = \frac{8\pi}{45}$

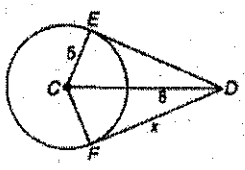


b)  $\overline{PA}$  and  $\overline{PB}$  are tangents to circle O. Find the measure of the intercepted arc indicated by x.

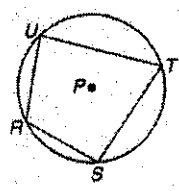


x = 140°

c)  $\overline{ED}$  and  $\overline{FD}$  are tangent to circle C. Find the value of x.



x ≈ 6.24



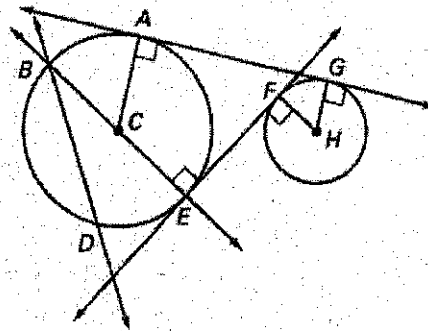
- d)  $m\angle RST = 95$  and  $m\overline{STU} = 220$ . Find
- $m\angle SRT = \underline{110}$
  - $m\angle RUT = \underline{85}$
  - $m\overline{TUR} = \underline{190}$
  - $m\overline{UTS} = \underline{220}$

14) Use the word bank to name the term that best describes the notation below.

Word Bank:

Radius	Central Angle	Major Arc
Minor Arc	Tangent Line	Diameter
Inscribed Angle	Circumscribed Angle	Chord

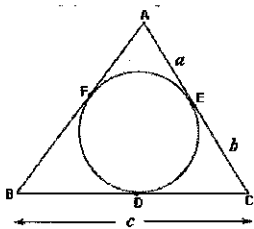
1.  $\overline{AB}$  Minor Arc
2.  $\angle AIE$  Circumscribed Angle
3.  $\angle ACE$  Central Angle
4.  $\overline{HG}$  Radius
5.  $\overline{BE}$  Diameter
6.  $\overline{BDA}$  Major Arc
7.  $\overline{BD}$  Chord
8.  $\angle DBE$  Inscribed Angle
9.  $\overline{AG}$  Tangent Line



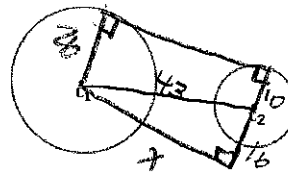
15) Triangle ABC is circumscribed about the circle. Find the perimeter of triangle ABC if  $a = 8$  cm,  $b = 9$  cm, and  $c = 18$  cm.

16)

The radius of Circle  $C_1 = 26$  in and the radius of circle  $C_2 = 10$  in. The distance between the centers of the two circles is 43 in. What is the horizontal length between the two points of tangency?

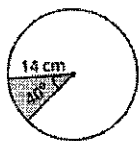


$P = 52$  cm



$x \approx 39.91$  in.

17) a)



Area =  $\frac{196\pi}{4} \text{ cm}^2 \approx 153.94 \text{ cm}^2$

$68.42 \text{ cm}^2$

b)



Length of the arc DE = 18.32 cm

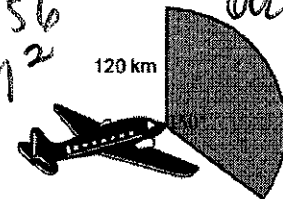
Area =  $25\pi \text{ cm}^2$

c)

The radar beam sent out by an aeroplane reaches a distance of 120 kilometres and covers an angle of  $150^\circ$ .

$18849.56 \text{ km}^2$

$6000\pi \text{ km}^2$

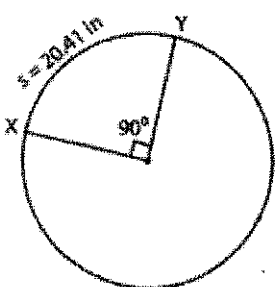


Calculate the area covered by the beam.

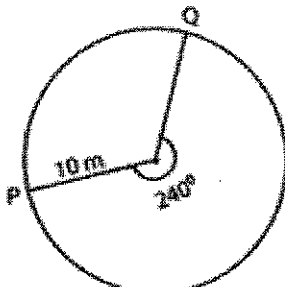
c) Find the central angle in radians.

18) a) Find the radius

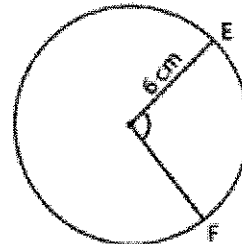
b) Find the length of the major arc.



$r \approx 12.99$  in



$\frac{40\pi}{3}$  m



$s = 10.47$  cm

$1.745 = \theta$