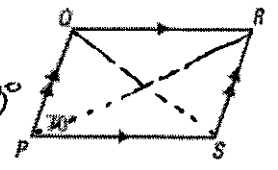


1) Given PQRS is a parallelogram, find the measure of angle  $\angle PSR$ . Explain how you know.

$m\angle PSR + m\angle OPS = 180$  b/c they are same side interior angles (Parallel lines)  $m\angle PSR = 110^\circ$



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

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:**

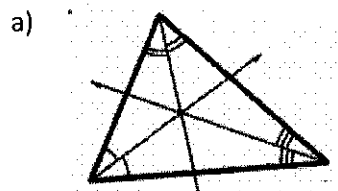
Incenter	Circumcenter	Centroid	<del>Vertex</del> <u>Vertices</u>
<u>Sides</u>	Gravity	Medians	Perpendicular Bisectors
Circumscribed	Inscribed	Angle Bisectors	Triangle

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.

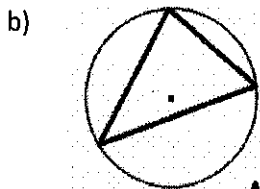
c) The point of concurrency for the medians of a triangle is called the Centroid. It is the center of Gravity for a triangle. It divides the Medians into two segments whose lengths are in a ratio of 2:1.

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



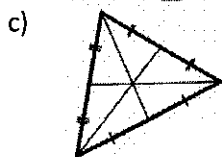
Name: Incenter

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



Name: \_\_\_\_\_ Explanation: \_\_\_\_\_

Circumcenter # is the center of the circle that is circumscribed around the triangle.



Name: \_\_\_\_\_ Explanation: \_\_\_\_\_

Centroid It is the intersection of all the medians.

5) Point T is the incenter of  $\triangle PQR$ .

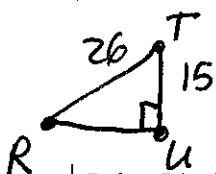
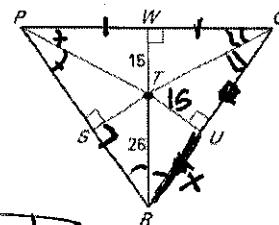
Find the measure of UR. Show your work or explain your reasoning.

m  $\angle TU = 15$  b/c it is the radius

$$22^2 + b^2 = 676$$

$$b^2 = 451$$

$$b \approx 21.24$$



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

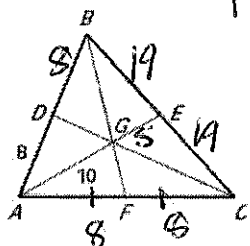
$$15^2 + b^2 = 26^2$$

5) Point G is the centroid of  $\triangle ABC$ .

If  $AD=8$ ,  $AG=10$ ,  $BE=19$ , and  $AC=16$ , find the perimeter of the triangle. Show your work or explain your reasoning.

$$P = 19 + 19 + 8 + 8 + 8 + 8$$

$$P = 70$$



7) Point O is the circumcenter of  $\triangle MNP$ .

Find the measure of SO. Show your work or explain your reasoning.

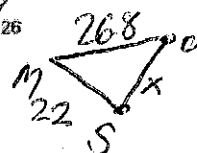
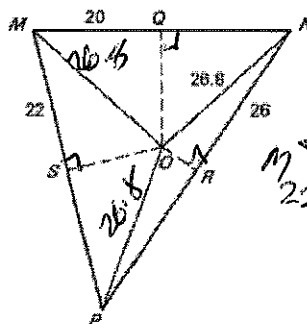
$$a^2 + b^2 = c^2$$

$$22^2 + b^2 = 26.8^2$$

$$484 + b^2 = 718.24$$

$$b^2 = 234.24$$

$$b = 15.3$$



3) Fill in the blanks below to make the statement true.

a) A tangent line to a circle is perpendicular to the radius drawn to the point of tangency.

b) The measure of a(n) central angle is equal to the measure of its intercepted arc.

c) If two arcs of a circle are congruent then their corresponding central angle measures are equal.

d) A radian is an angle unit equal to an angle at the center of the circle whose arc is equal in length to the radius.

e) The difference between a secant and a chord is that a chord is a line segment while a secant is a line.

f) A(n) inscribed angle is half the measure of its intercepted arc.

g) A circumscribed angle is 180 degrees minus the measure of its intercepted arc.

Write the formula for each:

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:  $\frac{\text{Sector Area}}{\pi r^2}$

$\frac{\text{Part}}{\text{whole}}$

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

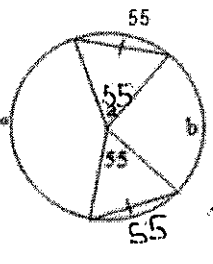
c) Ratio for a Central Angle in Degrees:  $\frac{\theta}{360}$

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

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

a =  $55^\circ$

b =  $40^\circ$

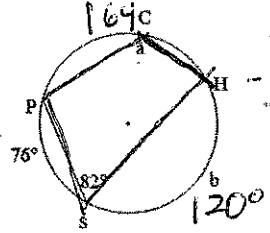


$360 - 210 = 150$   
 $150 \div 2 = 75$

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

a =  $98^\circ$

b =  $120^\circ$



$360 - 164 = 196$   
 $196 \div 2 = 98$

$120 + 76 = 196 \div 2$

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  $\overline{DB}$ .)

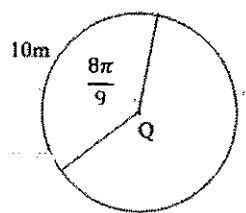
Prove that  $\triangle ABE \cong \triangle CDE$ .

1. $E$ is the midpoint of $\overline{AC}$ & $\overline{DB}$	1. Given	
2. $AE = EC$ $DE = EB$	2. Definition of Midpoint	
3. $\overline{AE} \cong \overline{EC}$ $\overline{DE} \cong \overline{EB}$	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.

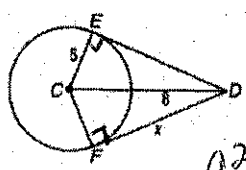
$\frac{8\pi}{9} = \frac{105}{2\pi r}$

$\frac{8}{9} = \frac{5}{\pi r}$



$\frac{8}{9} \pi r = \frac{5r^2}{r}$

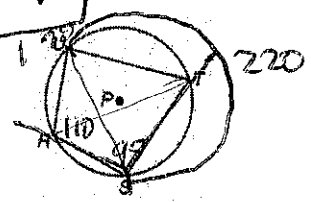
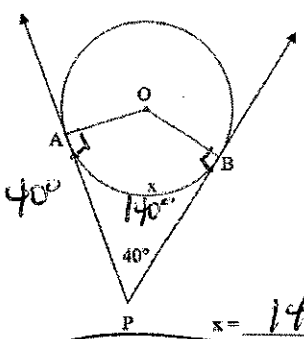
$\frac{8}{9} \pi = \frac{5r}{r}$   
 $8\pi = 5r$   
 $r = \frac{8\pi}{5}$



$a^2 + b^2 = c^2$   
 $5^2 + x^2 = 8^2$   
 $25 + x^2 = 64$   
 $x^2 = 39$   
 $x = \sqrt{39} \approx 6.24$

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

$180 - 40 = 140$



d)  $m\angle RST = 95$  and  $m\angle STU = 220$ . Find  
 $m\angle SRU = 110$   
 $m\angle RUT = 85$   
 $m\angle TUR = 190$   
 $m\angle RST = 95$

$95 \cdot 2 = 190$

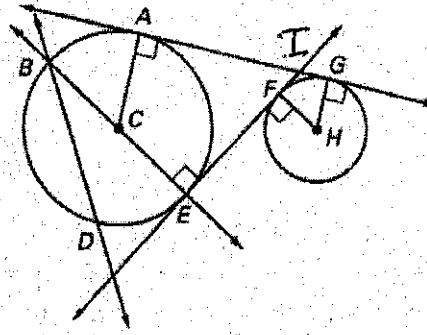
$360 - 190 = 170$   
 $170 \div 2 = 85$

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

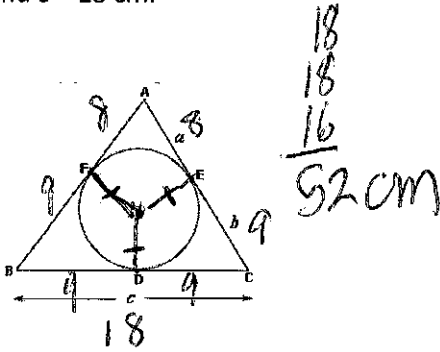
Word Bank:

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

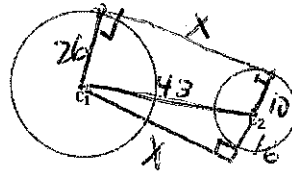
1.  $\overline{AB}$  Minor arc
2.  $\angle AIE$  Circumscribed Angle
3.  $\angle ACE$  Central Angle
4.  $\overline{HG}$  Radius
5.  $\overline{BE}$  Diameter
6.  $\overline{BDA}$  Major Arc
7.  $\overline{BD}$  Chord
8.  $\angle DBE$  Inscribed Angle
9.  $\overline{AG}$  Tangent Line



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?



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

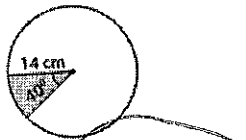
$$16^2 + b^2 = 43^2$$

$$256 + b^2 = 1849$$

$$b^2 = 1593$$

$$b \approx 39.9 \text{ in}$$

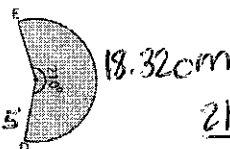
7) a)



Area =  $\frac{196\pi}{9} \text{ cm}^2$

$$\frac{40}{360} \cdot \pi (14)^2$$

b)



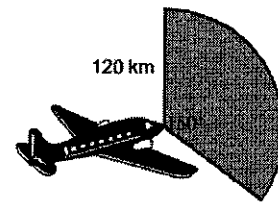
Length of the arc DE = 18.32 cm

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

$$A = \pi r^2 = \pi (5)^2 = 25\pi \text{ cm}^2$$

c)

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



$$\frac{150}{360} \cdot \pi (120)^2$$

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

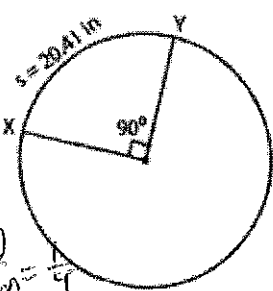
$$18849.56 \text{ km}^2$$

Calculate the area covered by the beam.

8) a) Find the radius

b) Find the length of the major arc.

c) Find the central angle in radians.

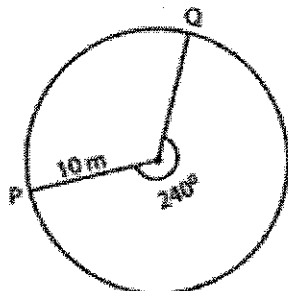


$$\frac{90}{360} = \frac{1}{4}$$

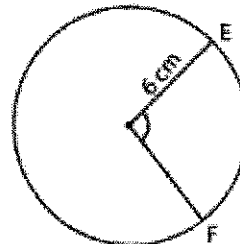
$$\frac{1}{4} 2\pi r = 20.41$$

$$\frac{1}{2} \pi r = 20.41$$

$$r \approx 12.99 \text{ m}$$



$$\frac{240}{360} \cdot 2\pi (10) = \frac{40\pi}{3} \text{ m}$$



$s = 10.47 \text{ cm}$

$$\frac{10.47}{2\pi(6)} = \frac{\theta}{2\pi}$$

$$1.745 = \theta$$