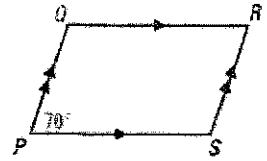


1) Given PQRS is a parallelogram, find the measure of angle $\angle PSR$. Explain how you know.

$m\angle PSR = 110$, same-side interior angles are supplementary when lines are parallel



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

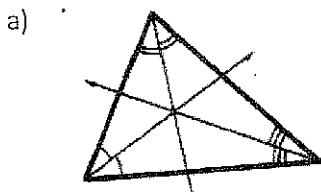
Incenter	Circumcenter	Centroid	Vertices
Sides	Gravity	Medians	Perpendicular Bisectors
Circumscribed	Inscribed	Angle Bisectors	Triangle

a) The angle bisectors of a triangle intersect at the incenter. This point is equidistant to each of the 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 of the vertices of the triangle, and is the center of a(n) circumscribed circle.

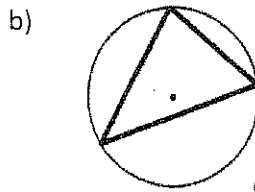
c) The point of concurrency for the medians of a triangle is called the centroid. It is ~~is~~ the center of gravity for a triangle. It divides the medians into two segments whose lengths are in a ratio of 2:1.

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



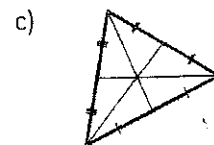
Name: incenter

Explanation: made by angle bisectors



Name: circumcenter

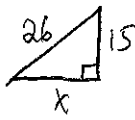
Explanation: center of circumscribed circle



Name: centroid

Explanation: made by medians

- 5) Point T is the incenter of $\triangle PQR$. Find the measure of UR. Show your work or explain your reasoning.



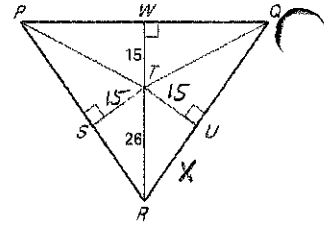
$$x^2 + 15^2 = 26^2$$

$$x^2 + 225 = 676$$

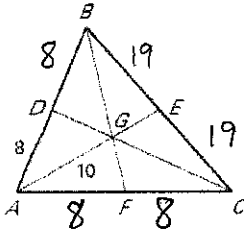
$$\quad -225 \quad -225$$

$$x^2 = 451$$

$$\sqrt{451} \approx 21.24$$



- 6) 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.

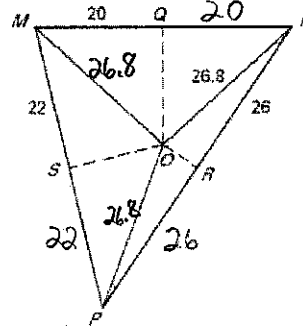


$$2(19) = 38$$

$$4(8) = 32$$

$$\underline{\underline{70}}$$

- 7) Point O is the circumcenter of $\triangle MNP$. Find the measure of SO. Show your work or explain your reasoning.



$$22^2 + x^2 = 26.8^2$$

$$484 + x^2 = 718.24$$

$$\sqrt{x^2} = \sqrt{234.24}$$

$$x = \underline{\underline{15.3}}$$

- 8) 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 congruent.
- 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.

9) Write the formula for each: a) Area of a circle = πr^2

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

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

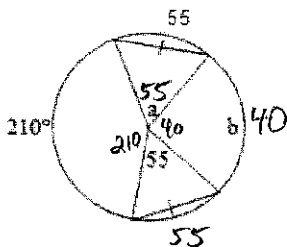
a) Ratio for finding Sector Area: $\frac{\text{sector area}}{\text{area of circle}}$

b) Ratio for finding Length of an Arc: $\frac{\text{arc length}}{\text{circumference}}$

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

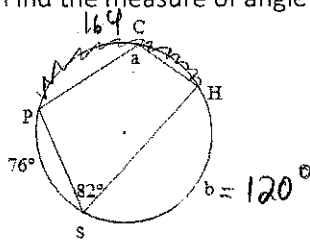
d) Ratio for a Central Angle in Radians: $\frac{\text{central angle}}{2\pi}$

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 $\triangle ABE \cong \triangle CDE$.

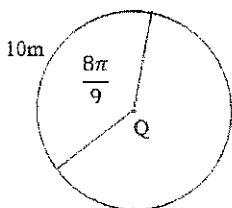
1. E is the midpoint of \overline{AC} and \overline{DB}	1. Given	
2. $\overline{AE} = \overline{EC}$ $\overline{BE} = \overline{ED}$	2. Definition of Midpoint	
3. $\overline{AE} \cong \overline{EC}$ $\overline{BE} \cong \overline{ED}$	3. Definition of Congruence	
4. $\angle AEB \cong \angle CED$	4. Vertical Angle Theorem	
5. $\triangle ABE \cong \triangle CDE$	5. SAS	

13) a) Find the radius.

$$\frac{10}{2\pi r} = \frac{8\pi}{9 \cdot 2\pi}$$

$$9 \cdot 20 = \frac{16\pi r}{9} \cdot 9$$

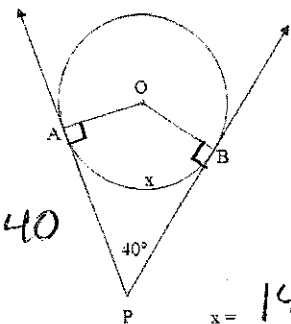
$$\frac{180}{16\pi r} = \frac{16\pi r}{16\pi r}$$



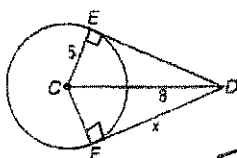
$r = 3.58m$

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

$$180 - 40 = 140$$



x = 140



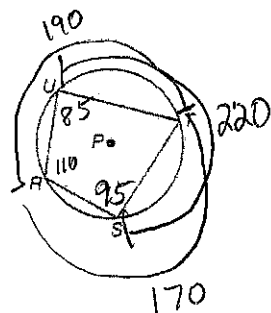
c) \overline{ED} and \overline{FD} are tangent to circle C. Find the value of x.

$$5^2 + x^2 = 8^2$$

$$25 + x^2 = 64$$

$$\sqrt{x^2} = \sqrt{39}$$

$x = 6.24$

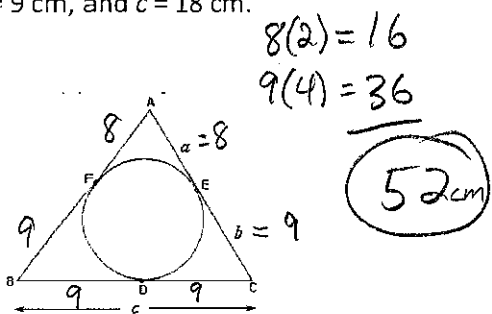


- d) $m\angle RST = 95$ and $m\widehat{STU} = 220$. Find
- $m\angle SRU = 110$
 - $m\angle RUT = 85$
 - $m\angle UTS = 70$
 - $m\widehat{TUR} = 190$
 - $m\widehat{RST} = 170$

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

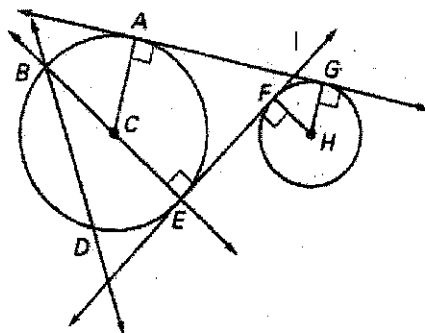
1. \overline{AB} minor arc
2. $\angle AIE$ circumscribed angle
3. $\angle ACE$ central angle
4. \overline{HG} radius
5. \overline{BE} diameter
6. \overline{BDA} major arc
7. \overline{BD} chord
8. $\angle DBE$ inscribed angle
9. \overline{AG} tangent line

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.



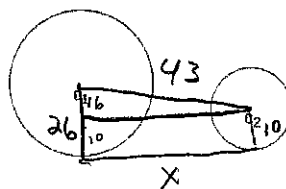
Word Bank:

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



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?



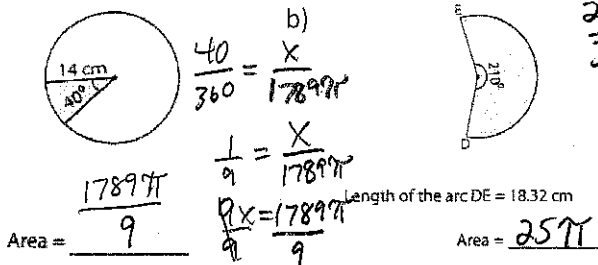
$$16^2 + x^2 = 43^2$$

$$256 + x^2 = 1849$$

$$\sqrt{x^2} = \sqrt{1593}$$

$$x = 39.91 \text{ in}$$

17) a)



$$\frac{210}{360} = \frac{18.32}{2\pi r}$$

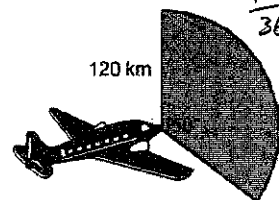
$$\frac{7}{12} = \frac{18.32}{2\pi r}$$

$$\frac{14\pi r}{14\pi} = \frac{219.84}{14\pi}$$

$$r = 4.998$$

c)

The radar beam sent out by an aeroplane reaches a distance of 120 kilometres and covers an angle of 150° .



$$\frac{150}{360} = \frac{15}{36} = \frac{5}{12}$$

$$\frac{5}{12} = \frac{x}{14,400\pi}$$

$$\frac{12x}{12} = \frac{72,000\pi}{12}$$

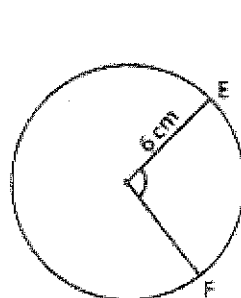
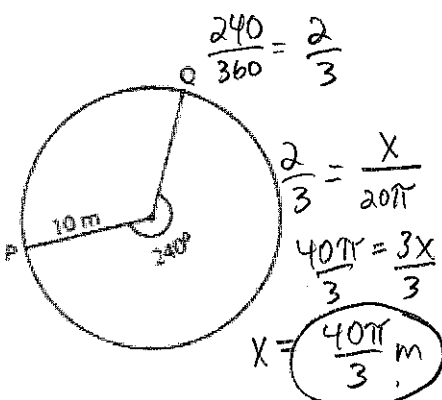
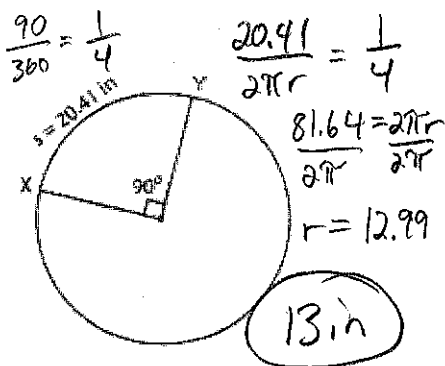
Calculate the area covered by the beam.

$$6000\pi$$

18) a) Find the radius

b) Find the length of the major arc.

c) Find the central angle in radians.



$$\frac{x}{2\pi} = \frac{10.47}{12\pi}$$

$$\frac{12\pi x}{12\pi} = \frac{20.94}{12\pi}$$

$$x = 1.745$$