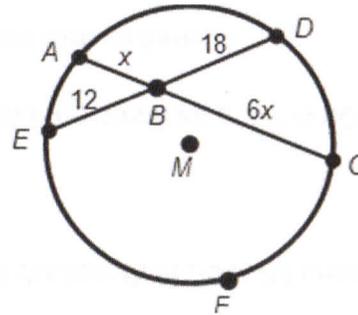


## Geometry Unit 06 PA 01

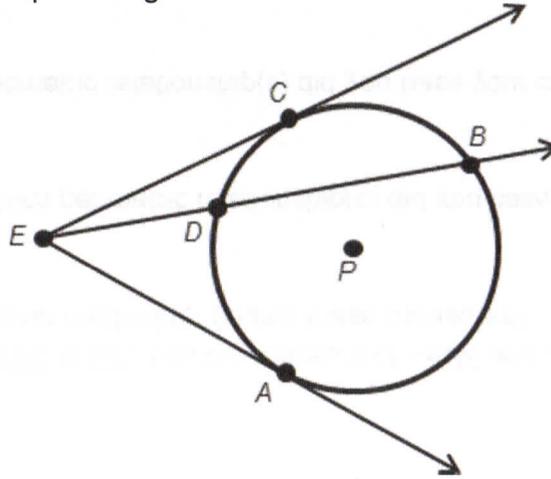
- Using a compass and straightedge, construct a circle with a radius of 4 inches. Label the center of the circle  $M$ . By paper folding, create two intersecting chords that intersect inside the circle but not at point  $M$ . Label these chords  $\overline{QS}$  and  $\overline{PR}$ . Label the point of intersection as point  $A$ .
  - Using your ruler determine  $PA$ ,  $AR$ ,  $QA$  and  $AS$  to the nearest millimeter.
  - What conjecture can be made about the geometric relationship formed by intersecting chords? Justify your reasoning.
  - Draw a central angle that opens on the same arc as  $\angle PAQ$ . Find the measure of the central angle and the measure of  $\angle PAQ$ . What geometric relationship can be justified about angles with the same intercepted arc?
  - From point  $S$  on the circle, draw  $\overline{SP}$ . Find the measure of  $\angle PSQ$ . What geometric relationship can be justified relating an inscribed angle and a central angle with the same intercepted arc?
- Use the diagram below to answer the questions pertaining to circle  $M$ , where  $\overline{EC}$  is the diameter of circle  $M$ . The diagram is not to scale.



- Calculate the length of  $\overline{AB}$  and  $\overline{BC}$ . What geometric relationship concerning intersecting chords can be used to justify your method for determining these lengths?
- If the measure of  $\widehat{AE}$  is  $32^\circ$  and the measure of  $\widehat{DC}$  is  $68^\circ$ , find the measure of  $\angle ABE$  and  $\angle DBC$ . What geometric relationship about arcs formed by intersecting chords and can be used to justify your method for finding these measures?
- Determine the measures of  $\widehat{AD}$  and  $\widehat{EFC}$ . On which geometric relationship(s) did you base your calculations?
- Determine the measure of  $\angle ACE$ . On which geometric relationship(s) did you base your calculations?

**Geometry Unit 06 PA 01, cont.**

3) Use the diagram below to answer the questions pertaining to circle  $P$ .



a) Given  $AE = 4x + 2$  and  $EC = 6x - 8$ , determine the length of each segment. What geometric relationship involving tangents can be used to find these lengths?

b) Using lengths calculated in a), what is the length of  $\overline{ED}$  if the length of  $\overline{DB}$  is 33 units? What geometric relationship can be used to justify your method for finding this length?

4) Ray  $PA$  is tangent to circle  $O$  at point  $A$ ,  $PA = 12$  units, and the measure of  $\overline{AR}$  is  $60^\circ$ . Answer the following and justify your answer using angle, arc, and special segments relationships with circles.

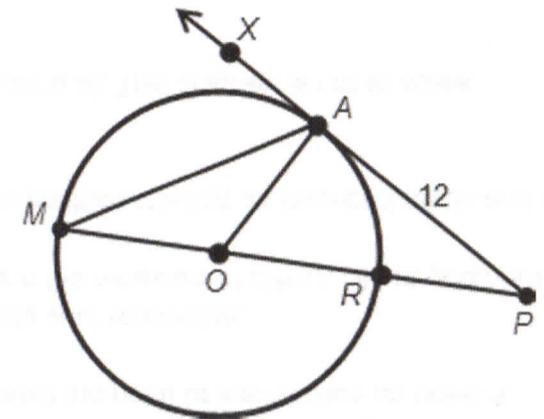
a) Find the length of the radius of circle  $O$ . Leave in simplified radical form.

b) Find the length of  $\overline{OP}$ . Leave in simplified radical form.

c) Determine the measure of  $\angle XAM$ .

d) Determine the measure of  $\angle APO$ .

e) Determine the measure of  $\overline{MAR}$ .



## Geometry Unit 06 PA 02

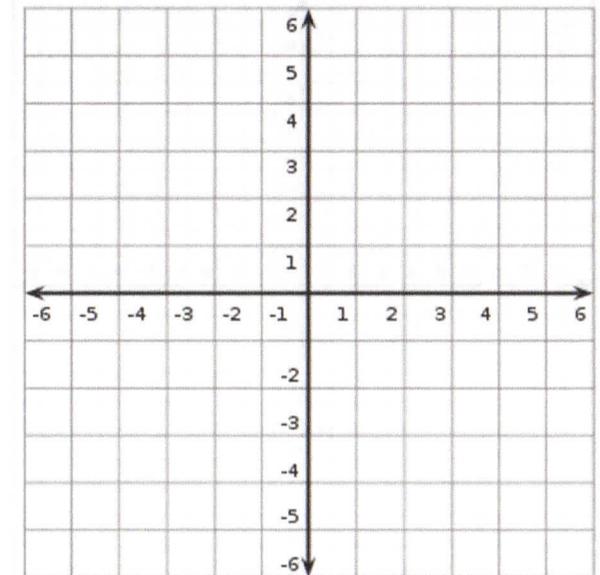
1) Circle A has a radius of 5 units and is centered at the origin.

a) On a coordinate plane graph circle A.

b) Label central angle  $\angle PAC$  such that  $m\angle PAC = 45^\circ$ . Justify your method.

c) Explain the relationship between the length of the radius and the length of  $\widehat{PC}$ .

d) Determine the radian measure for the arc formed.



2) Determine the value of the following angles in radian measure.

a)  $40^\circ$

b)  $240^\circ$

c)  $270^\circ$

d)  $310^\circ$

3) Determine the degree measure for the following angles.

a)  $\frac{\pi}{2}$

b)  $\frac{5\pi}{6}$

c)  $\frac{\pi}{5}$

d)  $\frac{5\pi}{3}$

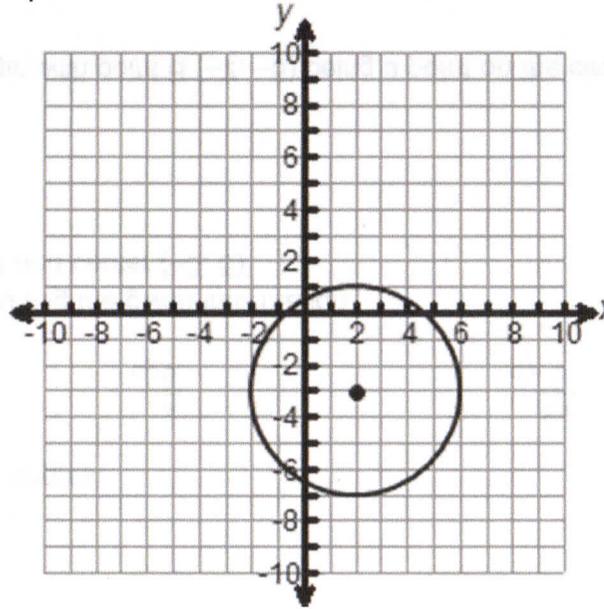
4) Determine the equation for the following circles using the given information.

a) Write an equation for a given circle with radius 4 and center  $(-3, 5)$ .

b) Write an equation of a circle centered at the origin with point B  $(-2, -5)$  being a point on the circle. Justify your answer.

**Geometry Unit 06 PA 02, cont.**

c) Find the equation of the circle using the given graph.



5) While waiting for clearance to land, a plane must fly in a circular holding pattern around the airport. The airport is located 4 miles east and 3 miles south of the center of town. The holding pattern takes the plane directly over the center of town.

a) With the origin representing the center of the town, graph a circle that represents the circular holding pattern of the airplane.

b) Determine the equation of the circle that represents the holding pattern of the airplane.

c) Justify your process for determining the equation of the circle.

