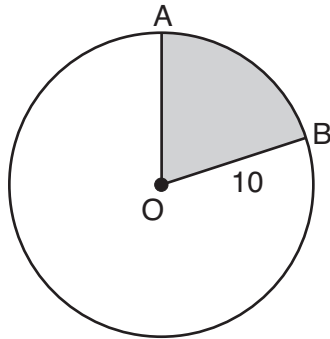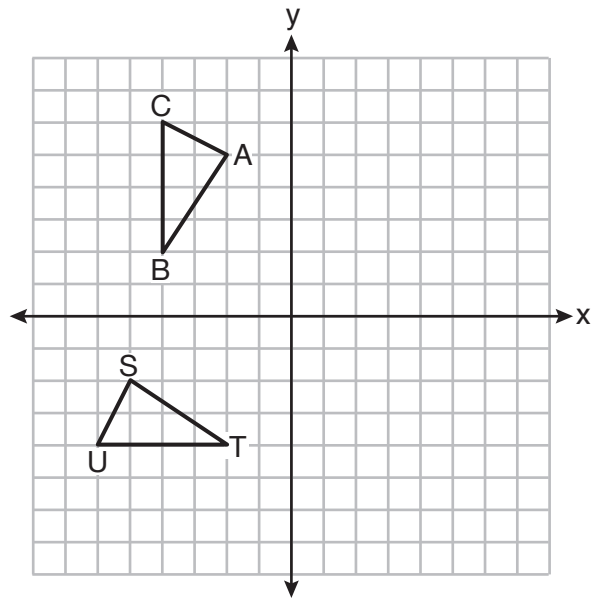**28** In the diagram below, circle O has a radius of 10.
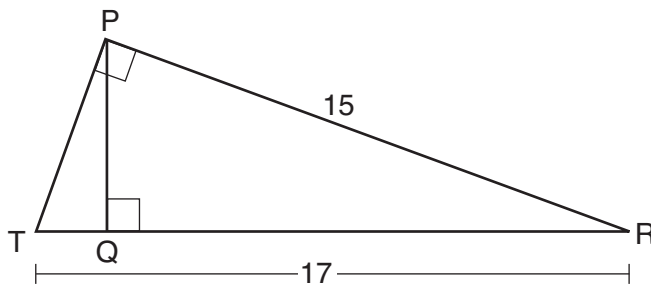

If $m\overarc{AB} = 72°$, find the area of shaded sector AOB, in terms of π.

**29** On the set of axes below, $\triangle ABC \cong \triangle STU$.

Describe a sequence of rigid motions that maps $\triangle ABC$ onto $\triangle STU$.

30 In right triangle *PRT*, m∠*P* = 90°, altitude $\overline{PQ}$ is drawn to hypotenuse $\overline{RT}$, *RT* = 17, and *PR* = 15.

Determine and state, to the *nearest tenth*, the length of $\overline{RQ}$.

31 Given circle O with radius $\overline{OA}$, use a compass and straightedge to construct an equilateral triangle inscribed in circle O. [Leave all construction marks.]

A

•O
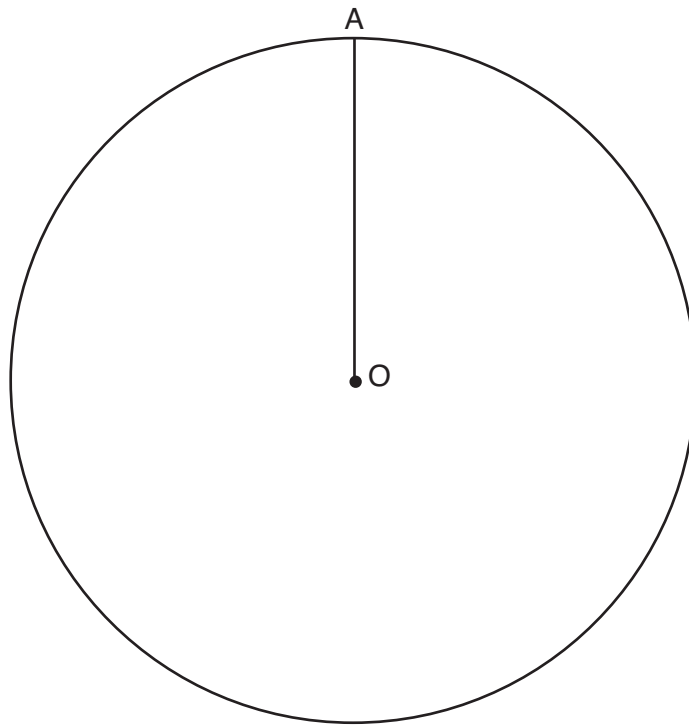
Answer all 3 questions in this part. Each correct answer will receive 4 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. Utilize the information provided for each question to determine your answer. Note that diagrams are not necessarily drawn to scale. For all questions in this part, a correct numerical answer with no work shown will receive only 1 credit. All answers should be written in pen, except for graphs and drawings, which should be done in pencil. [12]

32 Riley plotted $A(-1,6)$, $B(3,8)$, $C(6,-1)$, and $D(1,0)$ to form a quadrilateral.
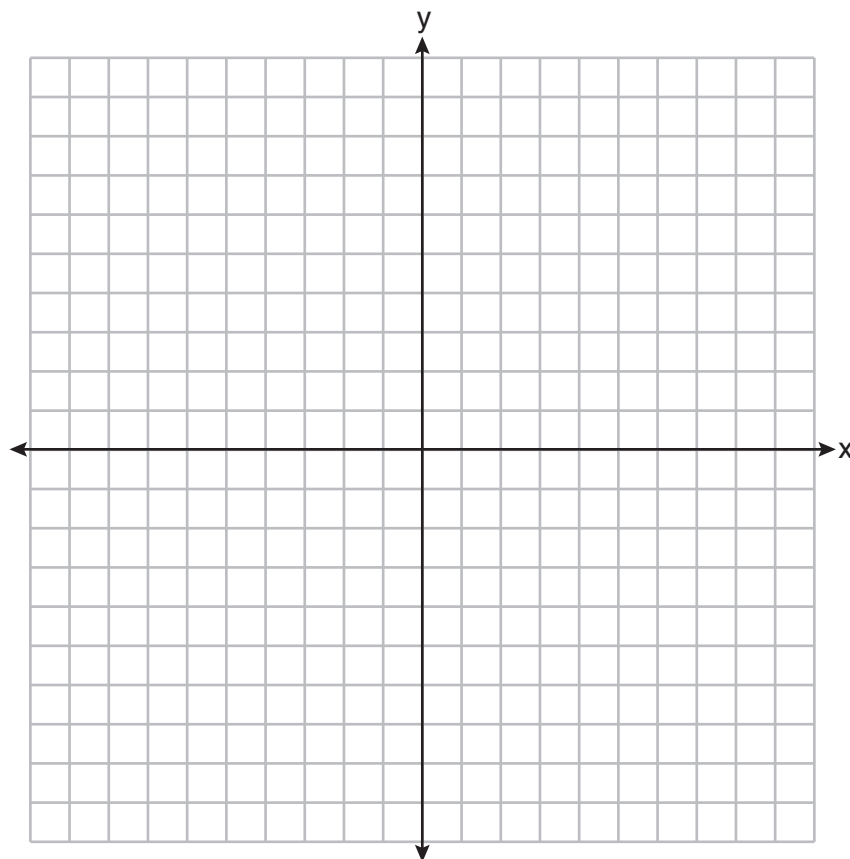
Prove that Riley's quadrilateral $ABCD$ is a trapezoid.

[The use of the set of axes on the next page is optional.]

**Question 32 is continued on the next page.**

Riley defines an isosceles trapezoid as a trapezoid with congruent diagonals. Use Riley's definition to prove that *ABCD* is *not* an isosceles trapezoid.

33 A child-sized swimming pool can be modeled by a cylinder. The pool has a diameter of $6\frac{1}{2}$ feet and a height of 12 inches. The pool is filled with water to $\frac{2}{3}$ of its height. Determine and state the volume of the water in the pool, to the *nearest cubic foot*.

One cubic foot equals 7.48 gallons of water. Determine and state, to the *nearest gallon*, the number of gallons of water in the pool.

34 Nick wanted to determine the length of one blade of the windmill pictured below. He stood at a point on the ground 440 feet from the windmill's base. Using surveyor's tools, Nick measured the angle between the ground and the highest point reached by the top blade and found it was 38.8°. He also measured the angle between the ground and the lowest point of the top blade, and found it was 30°.
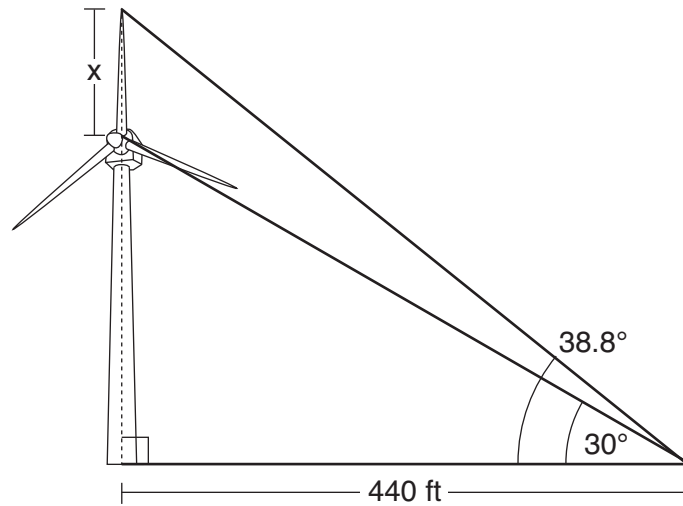

Determine and state a blade's length, x, to the *nearest foot*.

Answer the question in this part. A correct answer will receive 6 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. Utilize the information provided for the question to determine your answer. Note that diagrams are not necessarily drawn to scale. For the question in this part, a correct numerical answer with no work shown will receive only 1 credit. All answers should be written in pen, except for graphs and drawings, which should be done in pencil.   [6]

35 Given: Quadrilateral $MATH$, $\overline{HM} \cong \overline{AT}$, $\overline{HT} \cong \overline{AM}$, $\overline{HE} \perp \overline{MEA}$, and $\overline{HA} \perp \overline{AT}$
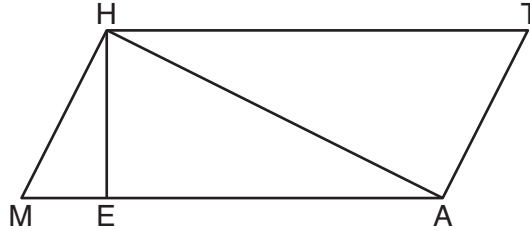
Prove: $TA \cdot HA = HE \cdot TH$

Work space for question 35 is continued on the next page.