

Practice Test - Chapter 10

1. **POOLS** Amanda's family has a swimming pool that is 4 feet deep in their backyard. If the diameter of the pool is 25 feet, what is the circumference of the pool to the nearest foot?

SOLUTION:

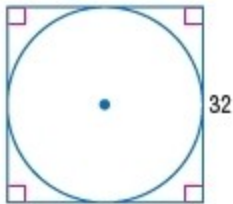
$$\begin{aligned}C &= \pi d && \text{Circumference Formula} \\ &= \pi(25) && \text{Substitution} \\ &\approx 79 && \text{Simplify.}\end{aligned}$$

So, the circumference of the pool is about 79 feet.

ANSWER:

79 ft

2. Find the exact circumference of the circle below.



SOLUTION:

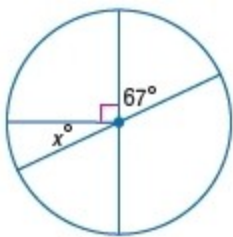
Here, the diameter of the circle is 32.

$$\begin{aligned}C &= \pi d && \text{Circumference Formula} \\ &= \pi(32) && \text{Substitution} \\ &= 32\pi && \text{Simplify.}\end{aligned}$$

ANSWER:

32π

Find the value of x .



3.

SOLUTION:

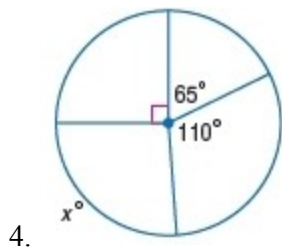
The sum of adjacent angles that form a line is 180.

$$\begin{aligned}x + 90 + 67 &= 180 && \text{Angle Addition Postulate} \\ x + 157 &= 180 && \text{Simplify} \\ x &= 23 && \text{Subtract 157 from each side.}\end{aligned}$$

ANSWER:

23

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SOLUTION:

If the measure of an arc is x , then the measure of the related central angle is x . The sum of the central angles of a circle is 360. So,

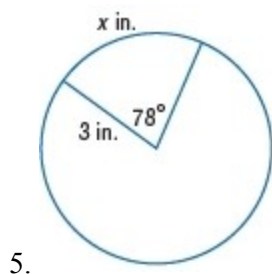
$$90 + 65 + 110 + x = 360 \quad \text{Sum of Central Angles}$$

$$265 + x = 360 \quad \text{Simplify.}$$

$$x = 95 \quad \text{Subtract 265 from each side.}$$

ANSWER:

95



SOLUTION:

Use $m = 78$ and $r = 3$ to find the length of the arc.

$$\ell = \frac{x}{360} \cdot 2\pi r \quad \text{Arc Length Equation}$$

$$x = \frac{78}{360} \cdot 2\pi(3) \quad m = 78, r = 3$$

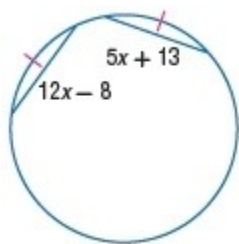
$$\approx 4.1 \quad \text{Use a calculator.}$$

Therefore, the value of x is about 4.1 inches.

ANSWER:

4.1 in.

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6.

SOLUTION:

If two arcs on the same circle are congruent, then the chords determined by the arcs are congruent.

$$12x - 8 = 5x + 13 \quad \text{Equal arcs cut equal chords.}$$

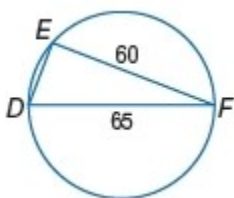
$$7x = 21 \quad \text{Add 8 and } -5x \text{ to each side.}$$

$$x = 3 \quad \text{Divide each side to each side.}$$

ANSWER:

3

7. **MULTIPLE CHOICE** What is ED ?



A 15

B 25

C 88.5

D not enough information

SOLUTION:

If $\angle DEF$ is a right angle, then using the Pythagorean Theorem the measure of ED would be $\sqrt{65^2 - 60^2}$ or 25.

$\angle DEF$ would be a right angle if it intercepts a semicircle or a diameter. There is no indication that $m(\text{arc } DF) = 180$ or that \overline{DF} passes through the center of the circle. Therefore, there is not enough information to determine the measure of ED .

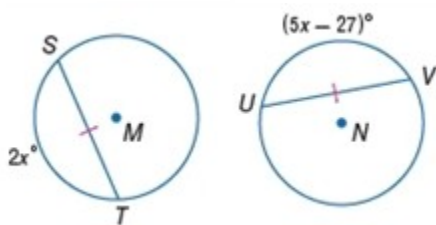
So, the correct choice is D.

ANSWER:

D

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8. Find x if $\odot M \cong \odot N$.



SOLUTION:

By Theorem 10.2, in the same circle or congruent circles, if two chords are equal, then their corresponding minor arcs are congruent.

$$m(\text{arc } ST) = m(\text{arc } UV) \quad \text{Theorem 10.2}$$

$$2x = 5x - 27 \quad \text{Substitution}$$

$$27 = 3x \quad \text{Add } -2x \text{ and } 27 \text{ to each side.}$$

$$9 = x \quad \text{Divide each side by 3.}$$

Therefore, $x = 9$.

ANSWER:

9

9. **MULTIPLE CHOICE** How many points are shared by concentric circles?

F 0

G 1

H 2

J infinite points

SOLUTION:

Concentric circles have the same center but the circles do not intersect. Therefore, the number of points shared by concentric circles is 0.

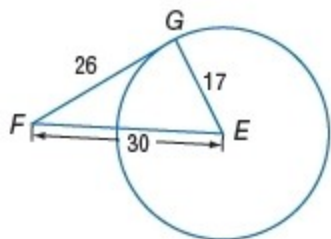
So the correct choice is F.

ANSWER:

F

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10. Determine whether \overline{FG} is tangent to $\odot E$. Justify your answer.



SOLUTION:

If is tangent to , then must be perpendicular to . This would make $\angle G$ a right angle and $\triangle FEG$ would be a right triangle. Use the converse of the Pythagorean Theorem to determine if $\triangle FEG$ is a right triangle.

$$30^2 \stackrel{?}{=} 26^2 + 17^2$$

$$900 \stackrel{?}{=} 676 + 289$$

$$900 \neq 965$$

No; Since $c^2 \neq a^2 + b^2$, $\triangle EFG$ is not a right triangle, so angle G is not a right angle and \overline{FG} cannot be tangent to



ANSWER:

No; $\triangle EFG$ is not a right triangle, so $\angle G$ is not a right angle and \overline{FG} cannot be tangent.

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11. **MULTIPLE CHOICE** Which of the figures below shows a polygon circumscribed about a circle?

A



B



C



D



SOLUTION:

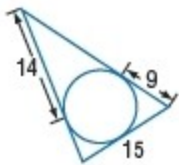
If a polygon is circumscribed about the circle, then each side of the polygon is tangent to the circle. The polygons in A and D have no sides that are tangent to the circles and in B only 3 of the 4 sides are tangent to the circle. All the sides of the polygon in C are tangent to the circle. Therefore, the correct choice is C.

ANSWER:

C

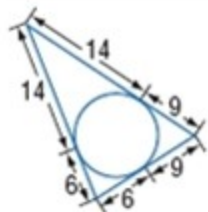
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12. Find the perimeter of the triangle. Assume that segments that appear to be tangent are tangent.



SOLUTION:

By Theorem 10.11, tangents to a circle from the same exterior point are congruent. There must be two segments with a measure of 14, two segments with a measure of 9, and two segments with a measure of $15 - 9$ or 6.



The three sides of the triangle are then $14 + 6$ or 20, $6 + 9$ or 15, and $14 + 9$ or 23.

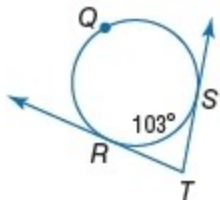
$$\begin{aligned} P &= a + b + c && \text{Perimeter formula for a triangle} \\ &= 20 + 15 + 23 && \text{Substitution} \\ &= 58 && \text{Simplify.} \end{aligned}$$

ANSWER:

58

Find each measure.

13. $m\angle T$



SOLUTION:

Major arc RQS shares the same endpoints with minor arc RS , so $m(\text{arc } RQS) = 360 - m(\text{arc } RS)$ or 257.

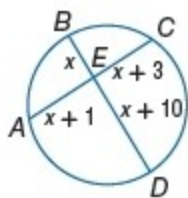
$$\begin{aligned} m\angle T &= \frac{1}{2}[m(\text{arc } RQS) - m(\text{arc } RS)] && \text{Theorem 10.14} \\ &= \frac{1}{2}[257 - 103] && m(\text{arc } RQS) = 257, m(\text{arc } RS) = 103 \\ &= \frac{1}{2}(154) && \text{Simplify.} \\ &= 77 && \text{Multiply.} \end{aligned}$$

ANSWER:

77

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14. x



SOLUTION:

$$BE \cdot ED = AE \cdot EC \quad \text{Theorem 10.15}$$

$$x(x + 10) = (x + 1)(x + 3) \quad \text{Substitution}$$

$$x^2 + 10x = x^2 + 4x + 3 \quad \text{Multiply.}$$

$$6x = 3 \quad \text{Subtract } x^2 \text{ and } 4x \text{ from each side.}$$

$$x = \frac{1}{2} \quad \text{Divide each side by 6.}$$

ANSWER:

$$\frac{1}{2}$$

15. **FLOWERS** Hannah wants to encircle a tree trunk with a flower bed. If the center of the tree trunk is the origin and Hannah wants the flower bed to extend to 3 feet from the center of the tree, what is the equation that would represent the flower bed?

SOLUTION:

The flower bed would be represented by the equation of a circle using $(h, k) = (0, 0)$ and $r = 3$.

$$(x - h)^2 + (y - k)^2 = r^2 \quad \text{Equation of a circle}$$

$$(x - 0)^2 + (y - 0)^2 = 3^2 \quad h = 0, k = 0, r = 3$$

$$x^2 + y^2 = 9 \quad \text{Simplify.}$$

ANSWER:

$$x^2 + y^2 = 9$$