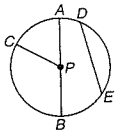
NAME _____ DATE _____ PERIOD ____

10-1 Skills Practice

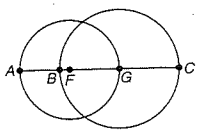
Circles and Circumference

For Exercises 1–5, refer to the circle at the right.



1. Name the circle.
   $\odot P$
2. Name a radius.
   $\overline{PA}$, $\overline{PB}$, or $\overline{PC}$
3. Name a chord.
   $\overline{AB}$ or $\overline{DE}$
4. Name a diameter.
   $\overline{AB}$
5. Name a radius not drawn as part of a diameter.
   $\overline{PC}$
6. Suppose the diameter of the circle is 16 centimeters. Find the radius.
   8 cm
7. If $PC = 11$ inches, find AB.
   22 in.

The diameters of $\odot F$ and $\odot G$ are 5 and 6 units, respectively. Find each measure.



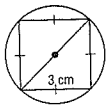
8. BF
   0.5
9. AB
   2

The radius, diameter, or circumference of a circle is given. Find the missing measures to the nearest hundredth.

10. $r = 8$ cm
    $d =$ 16 cm, $C \approx$ 50.27 cm
11. $r = 13$ ft
    $d =$ 26 ft, $C \approx$ 81.68 ft
12. $d = 9$ m
    $r =$ 4.5 m, $C \approx$ 28.27 m
13. $C = 35.7$ in.
    $d \approx$ 11.36 in., $r \approx$ 5.68 in.

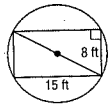
Find the exact circumference of each circle.

14.



$3\pi\sqrt{2}$ cm

15.



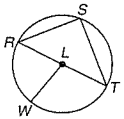
17π ft

NAME _____ DATE _____ PERIOD ____

10-1 Practice

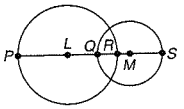
Circles and Circumference

For Exercises 1–7, refer to the circle at the right.



1. Name the circle.
   $\odot L$
2. Name a radius.
   $\overline{LR}$, $\overline{LT}$, or $\overline{LW}$
3. Name a chord.
   $\overline{RT}$, $\overline{RS}$, or $\overline{ST}$
4. Name a diameter.
   $\overline{RT}$
5. Name a radius not drawn as part of a diameter. $\overline{LW}$
6. Suppose the radius of the circle is 3.5 yards. Find the diameter. 7 yd
7. If $RT = 19$ meters, find LW. 9.5 m

The diameters of $\odot L$ and $\odot M$ are 20 and 13 units, respectively. Find each measure if $QR = 4$.



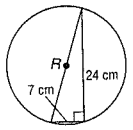
8. LQ
   6
9. RM
   2.5

The radius, diameter, or circumference of a circle is given. Find the missing measures to the nearest hundredth.

10. $r = 7.5$ mm
    $d =$ 15 mm, $C \approx$ 47.12 mm
11. $C = 227.6$ yd
    $d \approx$ 72.45 yd, $r \approx$ 36.22 yd

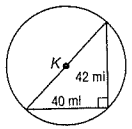
Find the exact circumference of each circle.

12.



25π cm

13.



58π mi

SUNDIALS For Exercises 14 and 15, use the following information.
Herman purchased a sundial to use as the centerpiece for a garden. The diameter of the sundial is 9.5 inches.

14. Find the radius of the sundial. 4.75 in.
15. Find the circumference of the sundial to the nearest hundredth. 29.85 in.

Answers

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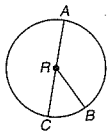
10-2 Study Guide and Intervention *(continued)*

Measuring Angles and Arcs

Arc Length An arc is part of a circle and its length is a part of the circumference of the circle.

Example **In $\odot R$, $m\angle ARB = 135$, $RB = 8$, and $\overline{AC}$ is a diameter. Find the length of $\overarc{AB}$.**



$m\angle ARB = 135$, so $m\overarc{AB} = 135$. Using the formula $C = 2\pi r$, the circumference is $2\pi(8)$ or 16π. To find the length of $\overarc{AB}$, write a proportion to compare each part to its whole.

$$\frac{\text{length of } \overarc{AB}}{\text{circumference}} = \frac{\text{degree measure of arc}}{\text{degree measure of circle}} \quad \text{Proportion}$$

$$\frac{\ell}{16\pi} = \frac{135}{360} \quad \text{Substitution}$$

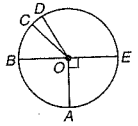
$$\ell = \frac{(16\pi)(135)}{360} \quad \text{Multiply each side by } 16\pi.$$

$$= 6\pi \quad \text{Simplify.}$$

The length of $\overarc{AB}$ is 6π or about 18.85 units.

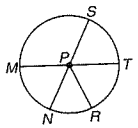
Exercises

The diameter of $\odot O$ is 24 units long. Find the length of each arc for the given angle measure. Round to the nearest tenth.



1. $\overarc{DE}$ if $m\angle DOE = 120$ 8π or 25.1
2. $\overarc{DEA}$ if $m\angle DOE = 120$ 14π or 44.0
3. $\overarc{BC}$ if $m\angle COB = 45$ 3π or 9.4
4. $\overarc{CBA}$ if $m\angle COB = 45$ 9π or 28.3

The diameter of $\odot P$ is 15 units long and $\angle SPT \cong \angle RPT$. Find the length of each arc for the given angle measure. Round to the nearest tenth.



5. $\overarc{RT}$ if $m\angle SPT = 70$ $\frac{35}{12}\pi$ or 9.2
6. $\overarc{NR}$ if $m\angle RPT = 50$ $\frac{10}{3}\pi$ or 10.5
7. $\overarc{MST}$ 7.5π or 23.6
8. $\overarc{MRS}$ if $m\angle MPS = 140$ $\frac{55}{6}\pi$ or 28.8

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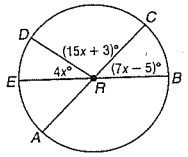
10-2 Skills Practice

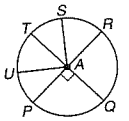
Measuring Angles and Arcs

ALGEBRA In $\odot R$, $\overline{AC}$ and $\overline{EB}$ are diameters. Find each measure.



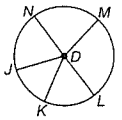
1. $m\angle ERD$ 28
2. $m\angle CRD$ 108
3. $m\angle BRC$ 44
4. $m\angle ARB$ 136
5. $m\angle ARE$ 44
6. $m\angle BRD$ 152

In $\odot A$, $m\angle PAU = 40$, $\angle PAU \cong \angle SAT$, and $\angle RAS \cong \angle TAU$. Find each measure.



7. $m\overarc{PQ}$ 90
8. $m\overarc{PQR}$ 180
9. $m\overarc{ST}$ 40
10. $m\overarc{RS}$ 50
11. $m\overarc{RSU}$ 140
12. $m\overarc{STP}$ 130
13. $m\overarc{PQS}$ 230
14. $m\overarc{PRU}$ 320

The diameter of $\odot D$ is 18 units long. Find the length of each arc for the given angle measure.



15. $\overarc{LM}$ if $m\angle LDM = 100$
    $5\pi \approx 15.71$ units
16. $\overarc{MN}$ if $m\angle MDN = 80$
    $4\pi \approx 12.57$ units
17. $\overarc{KL}$ if $m\angle KDL = 60$
    $3\pi \approx 9.42$ units
18. $\overarc{NJK}$ if $m\angle NDK = 120$
    $6\pi \approx 18.85$ units
19. $\overarc{KLM}$ if $m\angle KDM = 160$
    $8\pi \approx 25.13$ units
20. $\overarc{JK}$ if $m\angle JDK = 50$
    $2.5\pi \approx 7.85$ units

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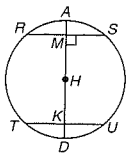
10-3 Skills Practice

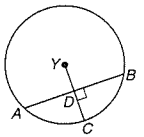
Arcs and Chords

In $\odot H$, $m\overset{\frown}{RS} = 82$, $m\overset{\frown}{TU} = 82$, $RS = 46$, and $\overline{TU} \cong \overline{RS}$. Find each measure.



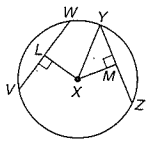
1. TU 46
2. TK 23
3. MS 23
4. $m\angle HKU$ 90
5. $m\overset{\frown}{AS}$ 41
6. $m\overset{\frown}{AR}$ 41
7. $m\overset{\frown}{TD}$ 41
8. $m\overset{\frown}{DU}$ 41

The radius of $\odot Y$ is 34, $AB = 60$, and $m\overset{\frown}{AC} = 71$. Find each measure.



9. $m\overset{\frown}{BC}$ 71
10. $m\overset{\frown}{AB}$ 142
11. AD 30
12. BD 30
13. YD 16
14. DC 18

In $\odot X$, $LX = MX$, $XY = 58$, and $VW = 84$. Find each measure.



15. YZ 84
16. YM 42
17. MX 40
18. MZ 42
19. LV 42
20. LX 40

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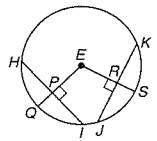
10-3 Practice

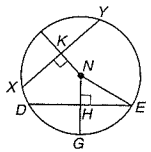
Arcs and Chords

In $\odot E$, $m\overset{\frown}{HQ} = 48$, $HI = JK$, and $JR = 7.5$. Find each measure.



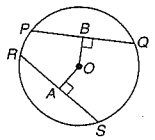
1. $m\overset{\frown}{HI}$ 96
2. $m\overset{\frown}{QI}$ 48
3. $m\overset{\frown}{JK}$ 96
4. HI 15
5. PI 7.5
6. JK 15

The radius of $\odot N$ is 18, $NK = 9$, and $m\overset{\frown}{DE} = 120$. Find each measure.



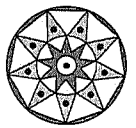
7. $m\overset{\frown}{GE}$ 60
8. $m\angle HNE$ 60
9. $m\angle HEN$ 30
10. HN 9

The radius of $\odot O = 32$, $\overset{\frown}{PQ} \cong \overset{\frown}{RS}$, and $PQ = 56$. Find each measure.



11. PB 28
12. OB $4\sqrt{15} \approx 15.49$
14. BQ 28
16. RS 56

13. **MANDALAS** The base figure in a mandala design is a nine-pointed star. Find the measure of each arc of the circle circumscribed about the star. Each arc measures 40°.



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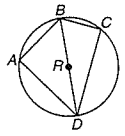
10-4 Study Guide and Intervention *(continued)*

Inscribed Angles

Angles of Inscribed Polygons An **inscribed polygon** is one whose sides are chords of a circle and whose vertices are points on the circle. Inscribed polygons have several properties.



- If an angle of an inscribed polygon intercepts a semicircle, the angle is a right angle.
- If a quadrilateral is inscribed in a circle, then its opposite angles are supplementary.

If $\overset{\frown}{BCD}$ is a semicircle, then $m\angle BCD = 90$.

For inscribed quadrilateral $ABCD$, $m\angle A + m\angle C = 180$ and $m\angle ABC + m\angle ADC = 180$.

Example **In $\odot R$ above, $BC = 3$ and $BD = 5$. Find each measure.**

a. $m\angle C$

$\angle C$ intercepts a semicircle. Therefore $\angle C$ is a right angle and $m\angle C = 90$.

b. CD

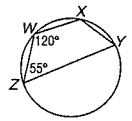
$\triangle BCD$ is a right triangle, so use the Pythagorean Theorem to find CD.

$(CD)^2 + (BC)^2 = (BD)^2$
$(CD)^2 + 3^2 = 5^2$
$(CD)^2 = 25 - 9$
$(CD)^2 = 16$
$CD = 4$

Exercises

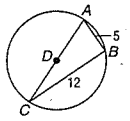
Find the measure of each angle or segment for each figure.

1. $m\angle X, m\angle Y$



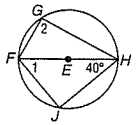
$m\angle X = 125$; $m\angle Y = 60$

2. AD



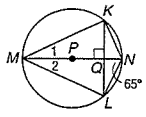
6.5

3. $m\angle 1, m\angle 2$



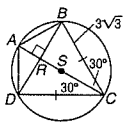
$m\angle 1 = 50$; $m\angle 2 = 90$

4. $m\angle 1, m\angle 2$



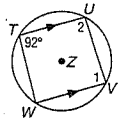
$m\angle 1 = 25$; $m\angle 2 = 25$

5. AB, AC



$AB = 3$; $AC = 6$

6. $m\angle 1, m\angle 2$



$m\angle 1 = 88$; $m\angle 2 = 92$

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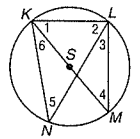
10-4 Skills Practice

Inscribed Angles

In $\odot S$, $m\overset{\frown}{KL} = 80$, $m\overset{\frown}{LM} = 100$, and $m\overset{\frown}{MN} = 60$. Find the measure of each angle.



1. $m\angle 1$ 50

2. $m\angle 2$ 60

3. $m\angle 3$ 30

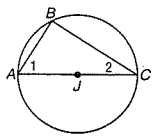
4. $m\angle 4$ 40

5. $m\angle 5$ 40

6. $m\angle 6$ 30

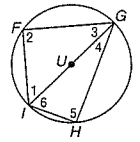
ALGEBRA Find the measure of each numbered angle for each figure.

7. $m\angle 1 = 5x - 2$, $m\angle 2 = 2x + 8$



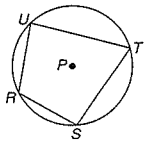
$m\angle 1 = 58$, $m\angle 2 = 32$

8. $m\angle 1 = 5x$, $m\angle 3 = 3x + 10$, $m\angle 4 = y + 7$, $m\angle 6 = 3y + 11$



$m\angle 1 = 50$, $m\angle 2 = 90$
$m\angle 3 = 40$, $m\angle 4 = 25$
$m\angle 5 = 90$, $m\angle 6 = 65$

Quadrilateral $RSTU$ is inscribed in $\odot P$ such that $m\overset{\frown}{STU} = 220$ and $m\angle S = 95$. Find each measure.



9. $m\angle R$ 110

10. $m\angle T$ 70

11. $m\angle U$ 85

12. $m\overset{\frown}{SRU}$ 140

13. $m\overset{\frown}{RUT}$ 190

14. $m\overset{\frown}{RST}$ 170

Answers