Geometry
Unit 8 Agenda - Circles Part 2

Name: _____

DATE	DAY	LESSON	PAGES	HOMEWORK
WED 2/15	8.1	Special Properties of Arcs & Chords	2 – 3	DeltaMath 8.1 due 3/1
THURS 2/16	8.2	Factoring & Tangent Segments in Circles	4 – 5	
FRI 2/17	8.2.5	Practice		
WINTER BREAK!!!				
MON 2/27	8.3	Two Chords, Two Secants, One Tangent & One Secant	6 – 8	
TUES 2/28	8.4	Quiz Review	9 – 10	Finish DM & Quiz Review
WED 3/1	8.5	**QUIZ TODAY!!!! GOOD LUCK!!!**	----------	
THURS 3/2	8.6	Circumference & Arc Length	11 – 12	DeltaMath 8.2 due 3/9
FRI 3/3	8.7	Area of Circle & Area of Sector	13 – 14	
MON 3/6	8.8	Area of Shaded Regions Practice	15 – 16	
TUES 3/7	8.9	Practice Test		
WED 3/8	8.10	Test Review	17 – 19	Finish DM and Test Review!!
THURS 3/9	8.11	**TEST TODAY!!!! GOOD LUCK!!!**	----------	

✳Agenda is subject to change!!!✳
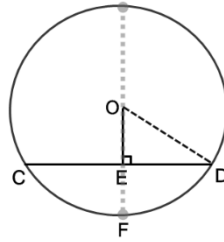
In a circle, if a _____ is perpendicular to a _____, then it _____ the chord and its arc.
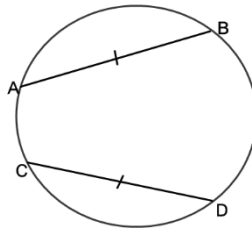
$$m\widehat{CF} \cong m\widehat{FD}$$
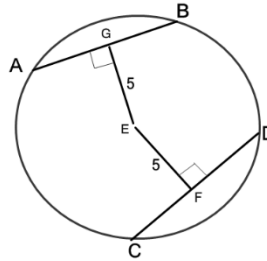and
$$\overline{CE} \cong \overline{ED}$$

In a circle or in congruent circles, _____ are congruent if and only if their _____ are congruent.

Given $\overline{AB} \cong \overline{CD}$
then $\widehat{AB} \cong \widehat{CD}$

In a circle or in congruent circles, _____ are congruent if and only if they are

_____.

Since $EG = EF$,
then $\overline{AB} \cong \overline{CD}$
and $\widehat{AB} \cong \widehat{CD}$

Examples

1.

$$\widehat{NP} = _____$$

2.
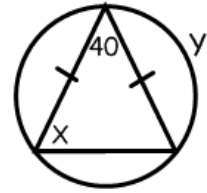
$$KM = _____$$

3.

$$XY = _____$$

4.

$$m\widehat{BC} = _____$$

5. mBC = _____
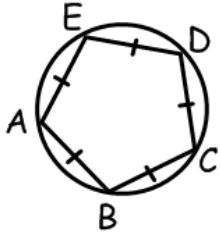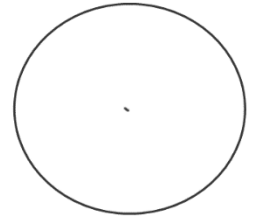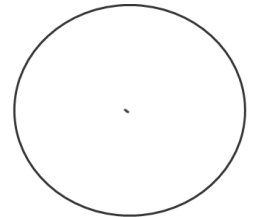

6. x = _____
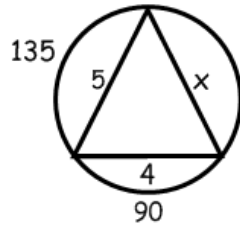
7. x = _____, y = _____,
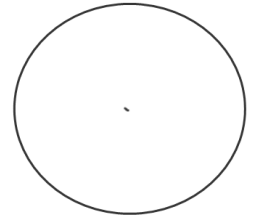   z = _____

8.   Suppose a chord is 20 inches long and is 24 inches from the center of the circle. Find the length of the radius.

9. Suppose the diameter of a circle is 30 centimeters long and a chord is 24 centimeters long. Find the distance between the chord and the center of the circle.

10. Find the length of a chord that is 5 inches from the center of a circle with a radius of 13 inches.

11. Suppose a radius of a circle is 17 units and a chord is 30 units long. Find the distance from the center of the circle to the chord.
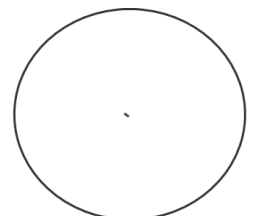
WARM-UP:

Simplify by expanding.

1. $(x + 2)(x – 4)$ 2. $(x – 6)^2$

Find solutions by solving (factoring is possible).

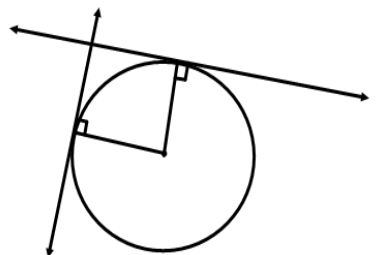3. $x^2 – 48 = 0$ 4. $x^2 + 7x + 10 = 0$ 5. $x^2 + 10x – 24 = 0$

_____: a line in the plane of a circle that intersects the circle in exactly one point.

$$\boxed{\textbf{Theorems involving Tangents}}$$

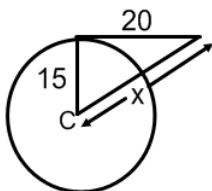If a line is _____ to a circle, then it is _____

to the radius drawn to the _____.

In a plane, if a line is _____ to a radius of a circle

at its endpoint on the circle, then the line is a _____

of the circle.

Examples

Find the value of x. Assume that C is the center of the circle and that segments that appear to be tangent are tangent.
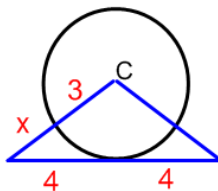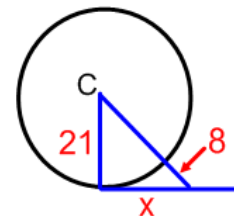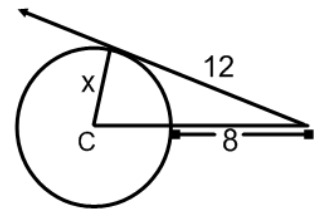
1. x=_____   2. x=_____   3. x=_____

4. x=_____
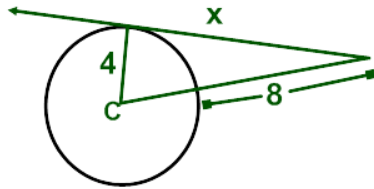
5. x=_____

| **Another Theorem involving Tangents** |

If two segments from the same _____ are tangent to a circle, then they are _____.

Examples

Find the value of x. Assume that C is the center of the circle and that segments that appear to be tangent are tangent.
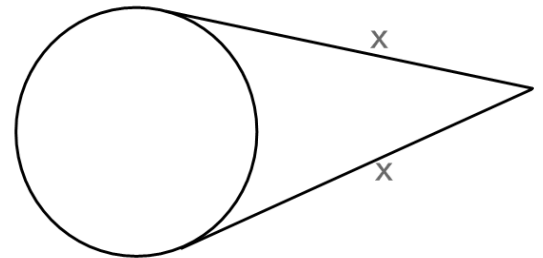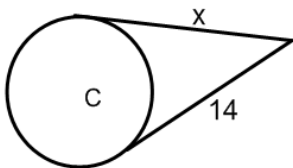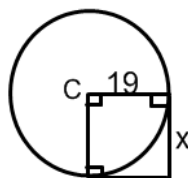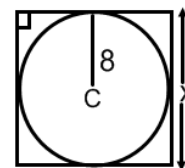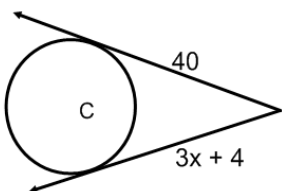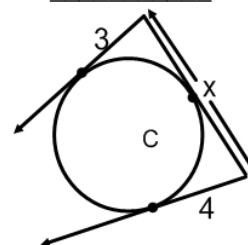
1. x = _____

2. x = _____

3. x = _____
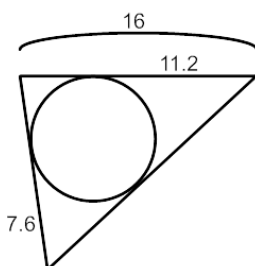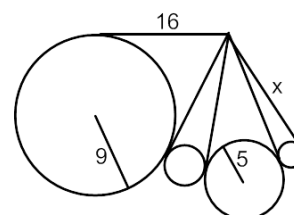

4. x = _____

5. x = _____

6. perimeter =_____

7. x = _____

Page 5

WARM-UP: Solve. Factoring may be required.

1. $x^2 - 4x + 24 = 0$ 2. $x^2 + 8 = 48$
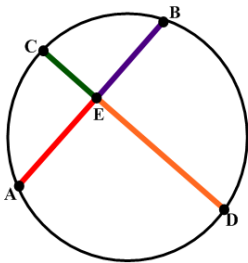
3. $x^2 - 18x - 88$ 4. $2x^2 + 4 = x^2 + x + 60$
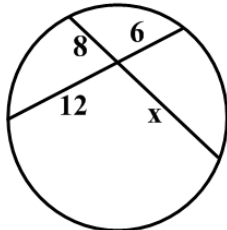
Two Chords Intersecting

If two chords intersect in the interior of a circle, then the product of the lengths of the segments of one chord is equal to the product of the lengths of the segments of the other chord.
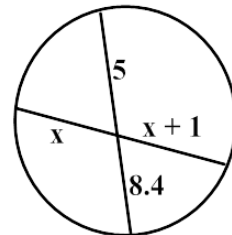

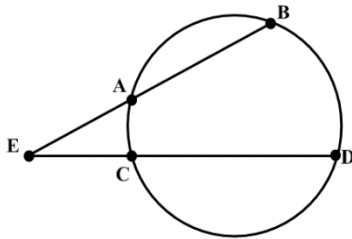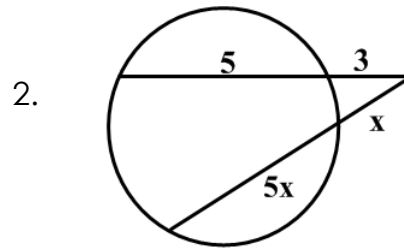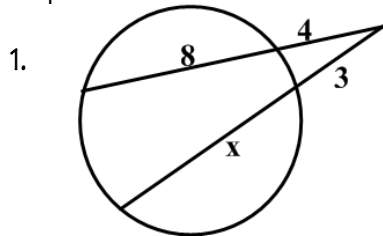_____ · _____ = _____ · _____

Examples:

1.

2.

Two Secant Segments Intersecting Outside a Circle

The product of the length of one external secant segment and its entire segment equals the product of the length of the other external secant segment and its entire segment.
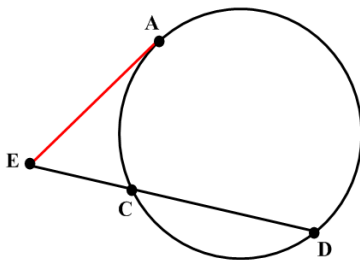
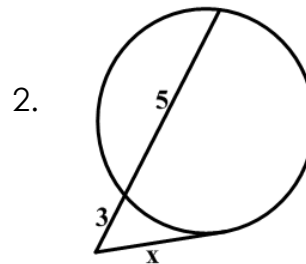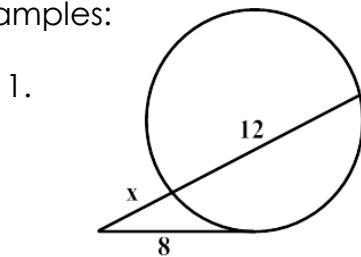_____ · _____ = _____ · _____

Examples:

1.

2.

A Secant Segment and a Tangent Segment Intersecting Outside a Circle

The square of the length of the tangent segment equals the product of the length of the external secant segment and the entire secant segment.
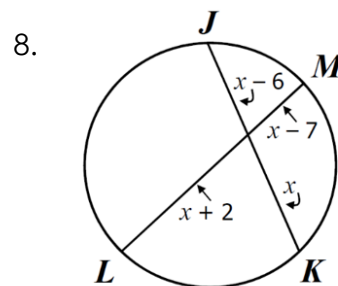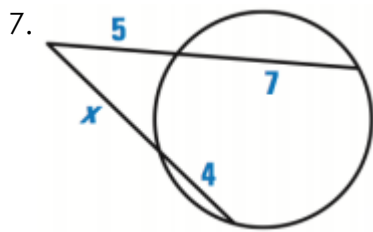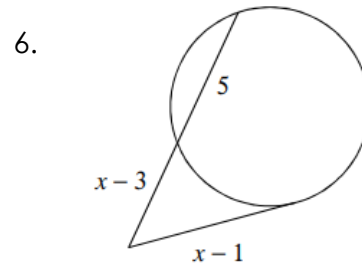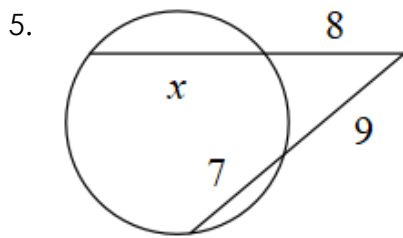
_____ = _____ · _____

Examples:

1.

2.

PUTTING IT ALL TOGETHER – Solve for x.

1.

12
10   6
x

2.

x   8
6
x + 8

3.

x
7   9

4.

6   P   X   Q
N
12
M

5.

8
x
9
7

6.

5
x − 3
x − 1

7.

5
7
x
4

8.

J
M
x − 6
x − 7
x + 2
x
L   K

Geometry DAY 8.4
Quiz Review – Circle Segments

Name: _____
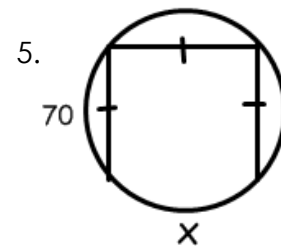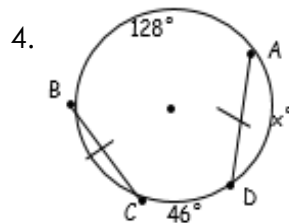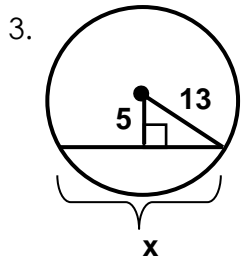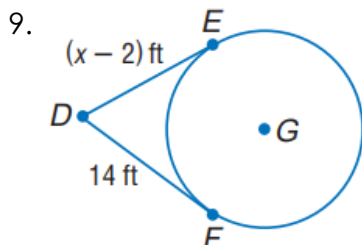
Date: _____
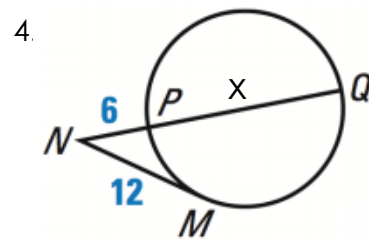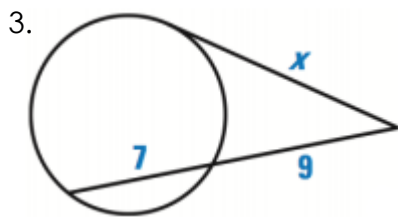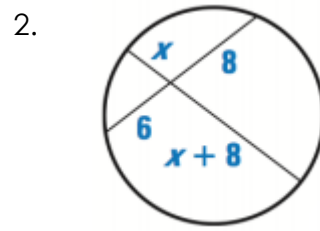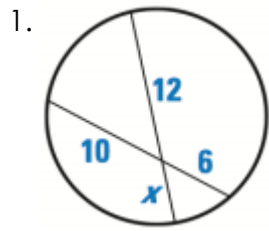
1. A chord is 7cm from the center. The diameter is 50 cm. Find the length of the chord.

2. A 12 cm chord is 8 cm from the center. Find the length of the radius of the circle.

Find the length of the segments indicated. Assume that segments that appear to be tangent are tangent.

3.

5
13
x

4.

128°
B
A
C 46°
D
x°

5.

70
x

6. In circle Z, PZ = QZ, XY = 4x – 5, and ST = -5x + 13. Find SQ.

X P Y
S
Z
Q
T

7.

Q
12 ft
T 8 ft
R x ft S

8.

K
x m
L
5 m
J •O
4 m
M
H 2 m N

9.

E
(x – 2) ft
D
•G
14 ft
F

10.

E
4
D
3
x F

11.

E
16
D
8
F
x
G

12.

A, x, D, 4, E, C, 3, 6, B

13.

2, 5, 4, x

14.

5, X, 4, x + 8

15.

4, 2, 3, x

16.

X, 10, 3, 5

17.

3x, 2x, 5, 7

18.

x, 2, 4

19.

x, 9, 3

20.

3, x, 8
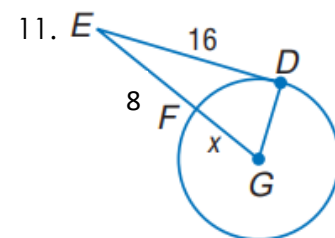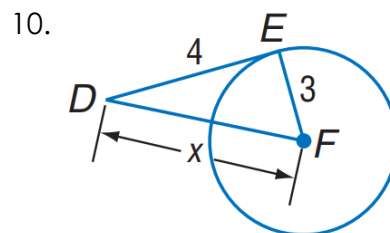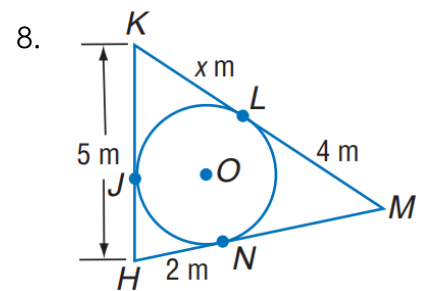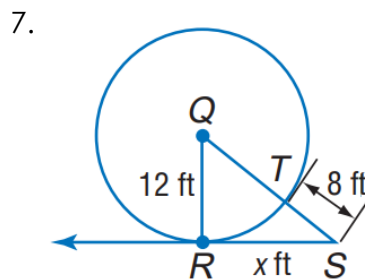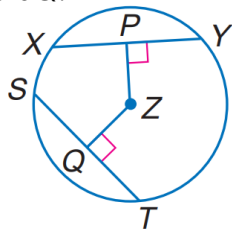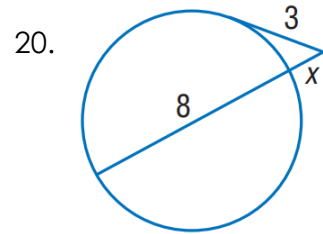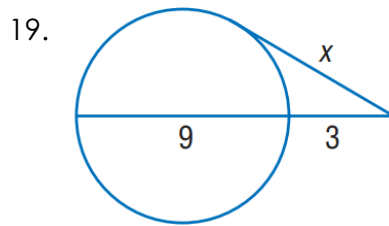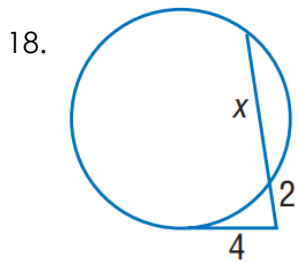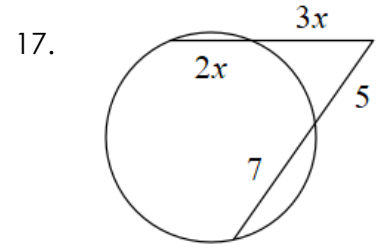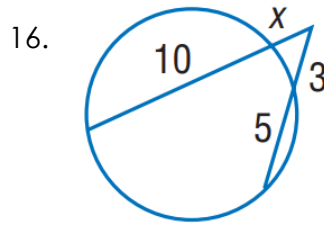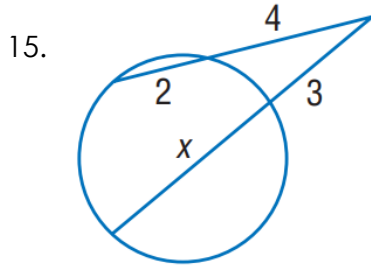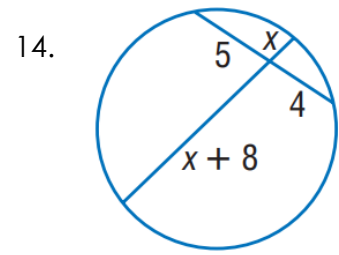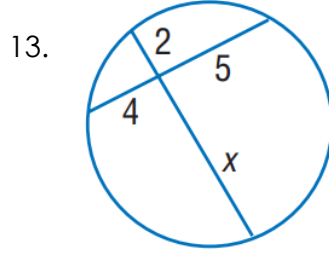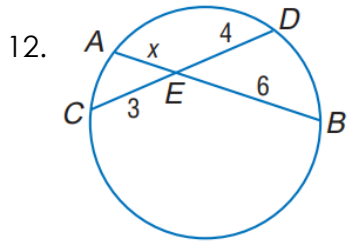
21. If $\overline{WX}$ is tangent to circle Y, find WX.

W, 23, Y, X, 25
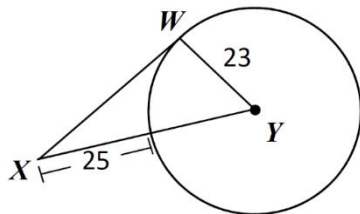
22. If $\overline{PQ}$ and $\overline{PR}$ are tangent to circle S, find PQ.

7x − 24, P, Q, S, 57 − 2x, R
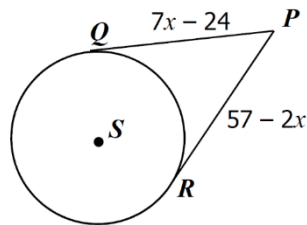
23. QZ = 15, PZ = 15, XY = 20
SQ = _____; SZ = _____

X, P, Y, S, Z, Q, T
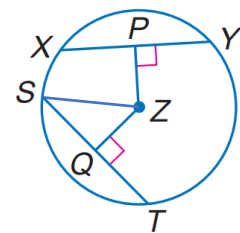
Geometry DAY 8.6   **Name** _____

Circumference and Arc Length   **Date** _____

Quick Reminder!

The **circumference** of a circle is <u>the distance around the circle</u>.

- For all circles, the ratio of the circumference to the diameter is the same.

- The ratio is known as **_pi_** or **π**.

- π = **3.14**

Circumference = π • diameter = πd

Since the diameter is 2 times the radius . . . | **Circumference = _2πr_** |

Practice Circumference Problems

1.   Find the circumference of a pumpkin pie with a 24 cm diameter.
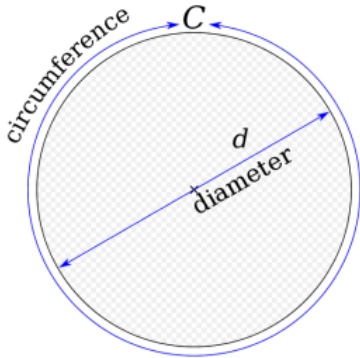   Round to 2 decimal places.

2.   A bicycle wheel has a radius of 45 cm. Find the circumference of the wheel.
      Leave your answer in terms of π.

3.   Find the radius of a discus with a circumference of 8.6π inches.
      Round to 2 decimal places.

4.   Find the diameter of a frisbee with a circumference of 12π inches.
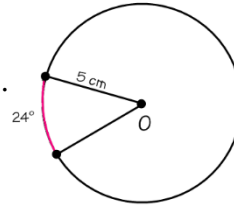   Round to 2 decimal places.

How do we find the length of an arc?

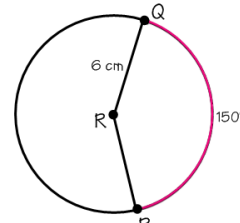An _____ is a portion of the circumference of a circle.

Arc Length = _____
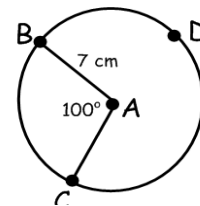
Practice Finding Arc Length!

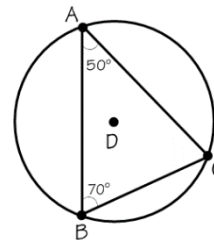1. Find the length of a 24° arc of a circle with a 5 cm radius. Leave your answer in terms of π.

2. Find the length of $\overset{\frown}{QP}$. Leave your answer in terms of π.

3. Find the length of $\overset{\frown}{BDC}$. Leave your answer in terms of π.
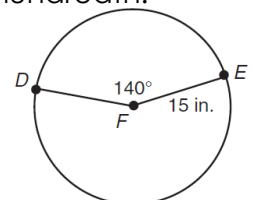
4. Circle D has radius 9 cm. What is the length of $\overset{\frown}{AB}$? Leave your answers in terms of π.

5. A circular pizza with a diameter of 14 inches is cut into 8 equal slices. What is the arc length of one slice? Leave your answers in terms of π.

6. Find the arc length of the minor arc. Round your answer to the nearest hundredth.

7. The gear of a grandfather clock has a radius of 3 inches. To the nearest tenth of an inch, what distance does the gear cover when it rotates through an angle of 88°?
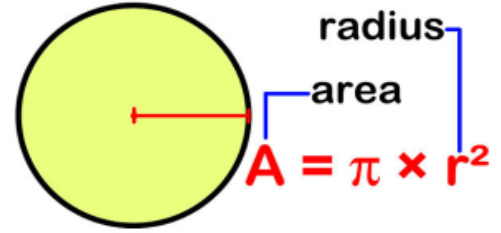
Name: _____

Date: _____

Review

The area of a circle is <u>the number of square units</u>
<u>inside the circle</u>.

radius⌐
⌐area

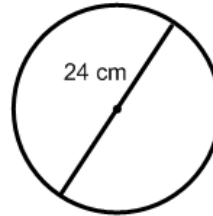$A = \pi \times r^2$

Area of a Circle = **πr^2**

Examples. Keep your answers in terms of pi.
1. Area = _____
2. Area = _____
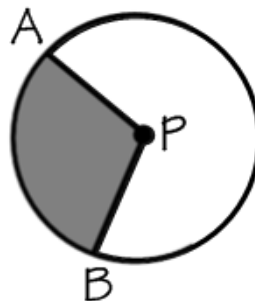3. Area = _____
4. Area= _____

15 ft

10 m

24 cm

.25 in
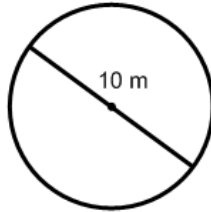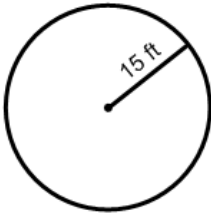
5. In terms of π, find the area of a circle whose diameter is 16.

6. Find the area of a circle whose circumference is 24π. Leave your answer in terms of π.

Area of a Sector of a Circle

A _____is the region bounded by two radii and their intercepted arc.
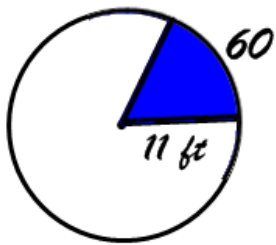
Area of a Sector =

A

P

B

Sector APB
is shaded
in circle P.

The unshaded
region is also a
sector.

Examples

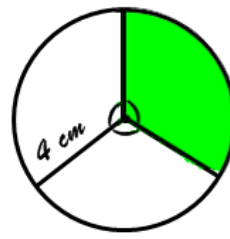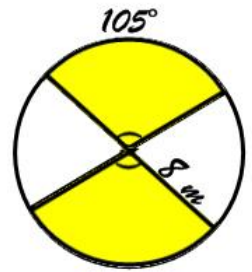**Find the area of the sector of the circle. Keep your answers in terms of pi.**
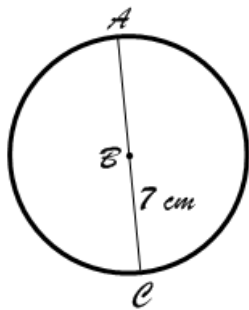
1. _____

2. _____

3. _____

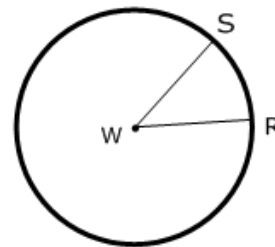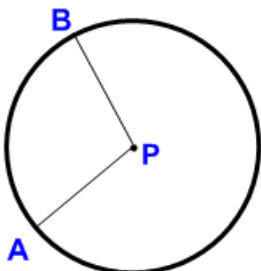

4. _____

5. Find the area of sector ABC. Round to the nearest hundredth.

6.   S and R are two points on circle W with radius 5 m and $m\angle SWR = 45°$. Find the area of the sector SWR. Round to the nearest hundredth.

7. Find the radius of circle P if the area of sector APB is 108π square feet and $m\angle APB = 120°$.

Geometry DAY 8.8   Name: _____
FUN PROBLEMS!   Date: _____
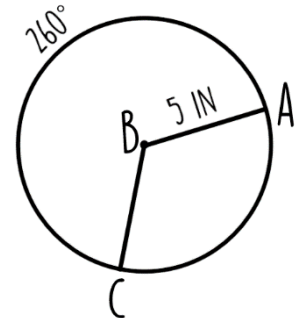
WARM-UP:

1. Answer the following questions. Leave your answers in terms of pi.

A. Circumference of circle: _____

B. Arc Length of $\widehat{AC}$: _____

C. Area of circle: _____

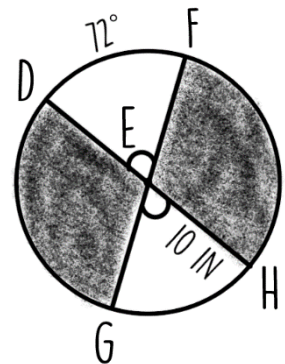D. Area of Sector ABC: _____

260°

B. 5 IN   A

C

2. Answer the following questions. Round your answers to the nearest tenth.

A. Circumference of circle: _____

B. Arc Length of $\widehat{GH}$: _____

C. Area of circle: _____

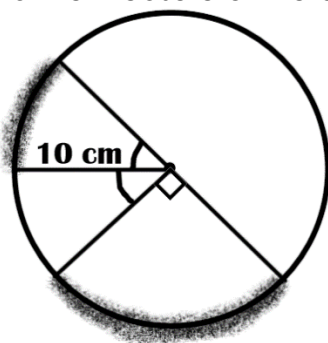D. Area of total shaded region: _____

72°   F

D   E

10 IN

H

G

3. Find the area of a circle if the circumference is 34π meters.

4. A circular pizza with a diameter of 16 inches is cut into 12 equal slices. If you eat two pieces of pizza, what is the total area of the pizza you ate? Leave your answer in terms of pi.
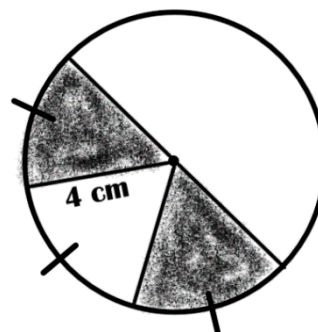
Find the measure of the bolded arcs.   Find the area of the shaded region.

1.   2.

10 cm   4 cm

A. In terms of pi: _____   A. In terms of pi: _____
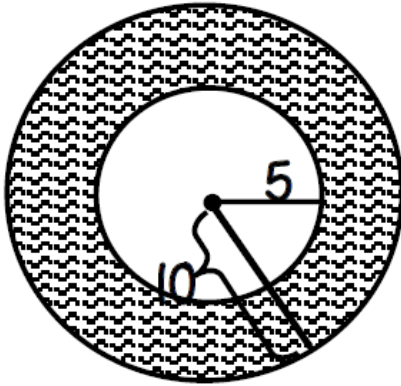
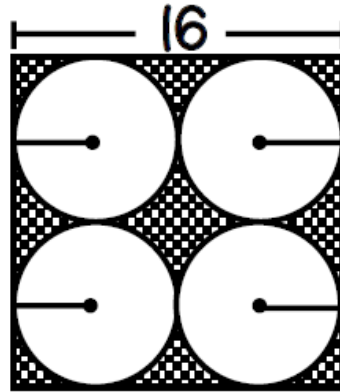B. Round to nearest tenth: _____   B. Round to nearest tenth: _____

Find the area of the shaded regions below. Round your answer to the nearest tenth.

3.

4.

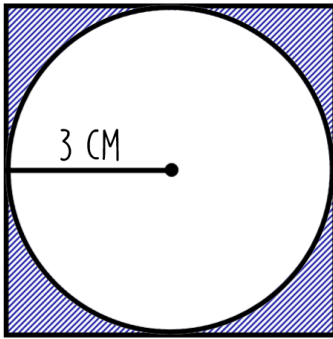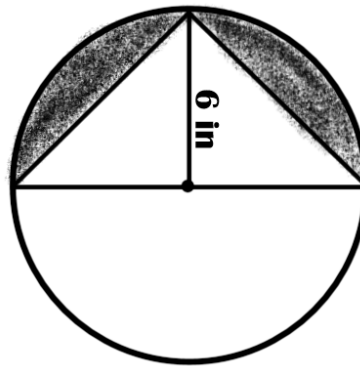Shaded Region: _____   Shaded Region: _____

5.

6. Reminder: Area of a triangle = ½bh

Shaded Region: _____   Shaded Region: _____

Geometry DAY 8.10   Name _____
Test Review   Date _____
Special Segments, Arc Length, Area of Sector

Find the value of x for each situation below. Assume that segments that appear to be tangent are tangent.

1.

2.

3.

4.

5.

6.

7.

8.

9.

10.

11.

12.

13. Find WU.

U —6— T   C
5
V
    x + 7
W
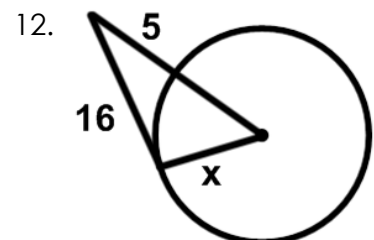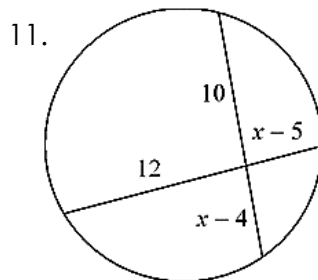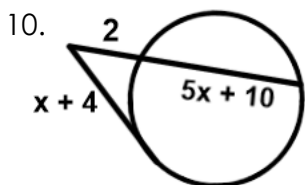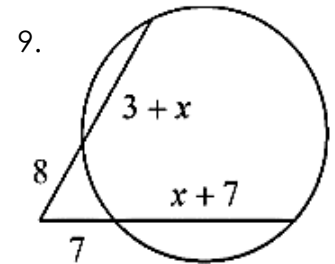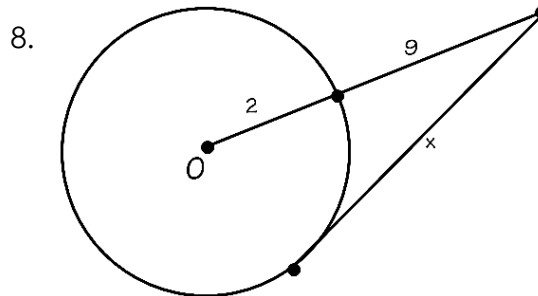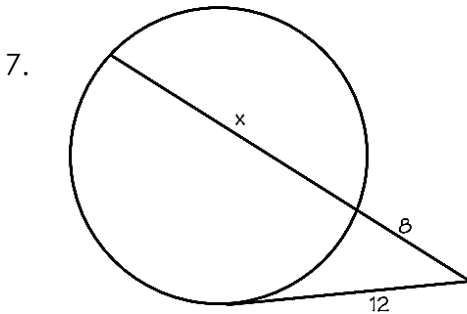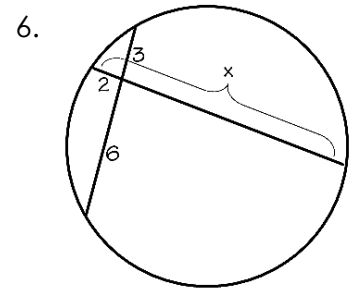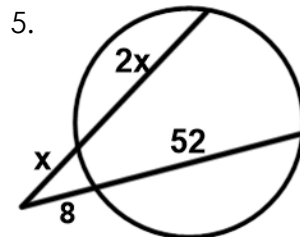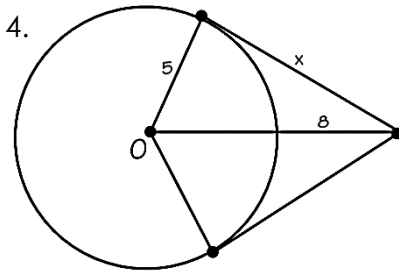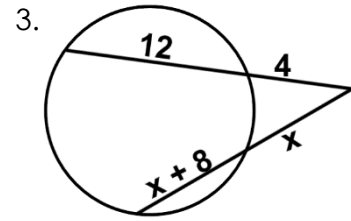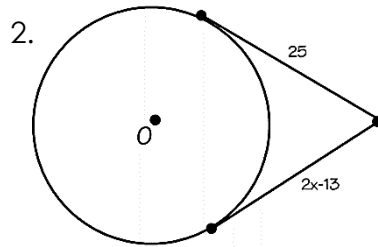
14. Find the perimeter of the triangle.
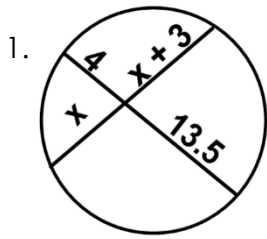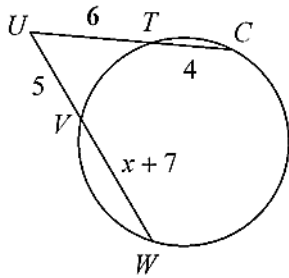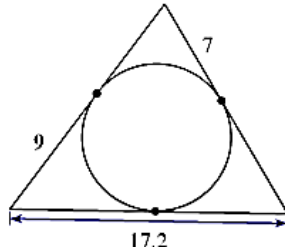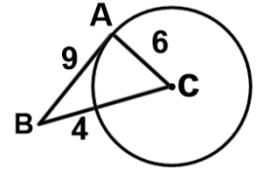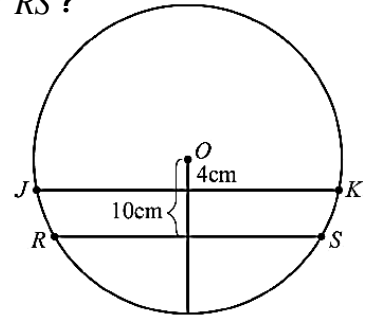
7
9
17.2

15. Determine whether $\overline{AB}$ is tangent to circle C. Circle YES or NO, and SHOW ALL WORK!

Work: YES or NO

A
9   6
C
B   4

16. The radius of circle O is 20 cm. Chord $\overline{JK}$ is located 4 cm from the center of the circle. Chord $\overline{RS}$ is located 10 cm from the center of the circle. What is the length of $\overline{RS}$?

O
4cm
J   K
10cm
R   S

#17 – 18: Find the indicated measures of the circles. Round to the nearest tenth. Use π ≈ 3.14.

17. Determine the circumference of a circle whose area is $\dfrac{25}{36}\pi$ in.

18. If the diameter of a circle is 24 ft., determine the circumference of the circle.

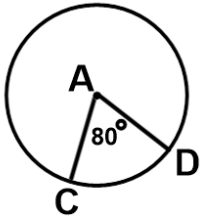**#19 – 20: Find the indicated measures of the circles. Leave your answers in terms of π.**

19. If the area of a circle is 17π ft²., determine the radius of the circle.

20. Determine the area of a circle whose circumference is 7.4π in.

**#21 – 26: Leave your answers in terms of π.**

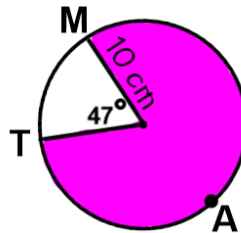21. If circle A has a diameter of 18 in., determine the length of $\overarc{CD}$.

22. You and three friends split a pizza equally. The pizza has a diameter of 16 inches, determine the arc length of your portion of the pizza.

23. Shana is about to perform a relay handoff on a circular track that has a radius of 13 meters and her track partner Sam is standing $78°$ away from her. How many meters does Shana need to run to pass the baton to Sam?

24. Determine the area of the shaded region if $m\angle LMN = 55°$.
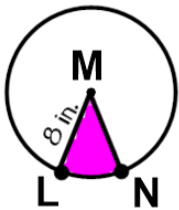
25. Determine the area of the shaded region.

26. Area of the shaded region = _____