

11.3 Sectors and Segments of Circles

Lesson objectives

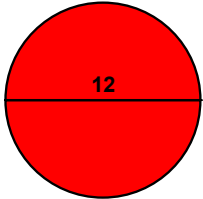
1. Find the area the area of a sector of a circle.

2. Find the area of a segment of a circle.

Oct 27-1:47 PM

The diameter of this circle is 12 cm. Find its area.

HINT



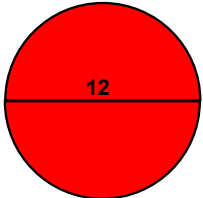
A = ?

Give your answer in terms of π .

Page 3

What is the area of each semi-circle (in terms of π)?

HINT

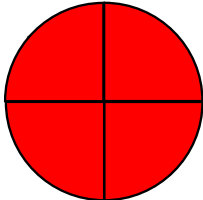


INSTRUCTIONS

Page 4

What is the area of a quarter-circle (in terms of π)?

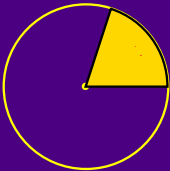
HINT



INSTRUCTIONS

Page 5

Sector area is a "slice" of the circle bounded by two radii and an arc.

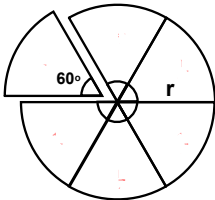


Sector Area

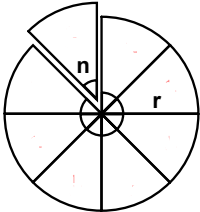
$$\frac{\text{sector area}}{\pi r^2} = \frac{m \text{ angle}^\circ}{360^\circ}$$
$$\text{Sector area} = \frac{x^\circ}{360^\circ} \cdot \pi r^2$$

sector area

The area of the sector of a circle



$$A = \frac{60}{360} \pi r^2$$



$$A = \frac{n}{360} \pi r^2$$

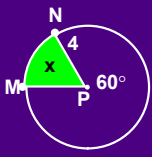
Page 6

Given circle P "Find x"

$\frac{\text{sector area}}{\pi 4^2} = \frac{60^\circ}{360^\circ}$

Sector area = $\frac{60^\circ}{360^\circ} \cdot \pi 4^2$

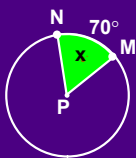
Sector area = 2.67π or $8/3\pi$



sector area example

Given circle P
(state answer in π)

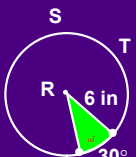
If $r = 6$ in, find the "x" sector area.



response question 3

Given circle R
(state answer in π)

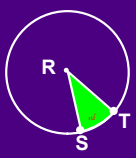
If $r = 6$ in.
Find sector SRT.



response question 4

Given circle PR
(state answer in π)


If $r = 3$ in, and
sector area = $540/3 \pi$
Find $m\angle SRT = \underline{\hspace{1cm}}^\circ$



response question 5

The area of sector AOB is $432\pi \text{ ft}^2$ and the measure of $\angle AOB$ is 120° . Find the length of the radius.

response question 6

 **sector of a circle** is a region of a circle bounded by a central angle and its intercepted major or minor arc. The formula for the area of a sector is similar to the formula for arc length.

Remember:

central angle an angle with a vertex in the center of a circle and with sides that contain two radii of the circle


arc a portion of a circle defined by two endpoints

KeyConcept Area of a Sector

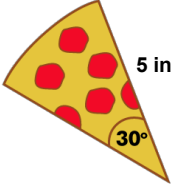
The ratio of the **area A of a sector** to the **area of the whole circle, πr^2** , is equal to the ratio of the **degree measure of the intercepted arc x** to 360.

Proportion: $\frac{A}{\pi r^2} = \frac{x}{360}$

Equation: $A = \frac{x}{360} \cdot \pi r^2$



Find the area of the slice



$A = \frac{30}{360}(\pi 5^2)$

A =

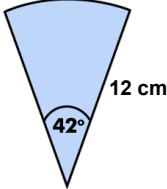
Answer to nearest hundredth.

ANSWER

ANSWER

Page 7

Find the area of the sector



$A = \frac{42}{360}(\pi 12^2)$

A =

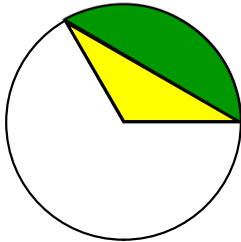
Answer to nearest hundredth.

ANSWER

ANSWER

Page 8

How could you find the area of the green segment?



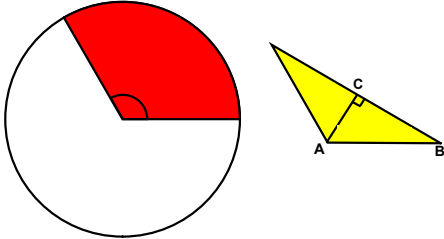
Drag the green segment to reveal the sector.

DRAG

HINT

Page 9

What dimensions do you need to solve the problem?



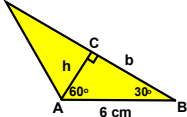
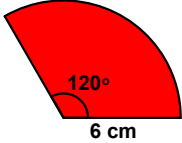
HINT

QUESTION

HINT

Page 10

Calculate the dimensions of the triangle



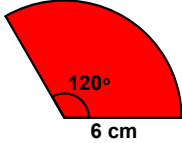
HINT

ANSWER

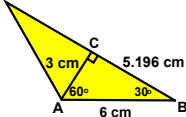
HINT

Page 11

Calculate the areas



$\frac{120}{360}(\pi 6^2)$



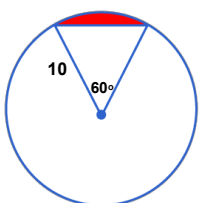
$\frac{1}{2}(3)(5.196)$

ANSWER

ANSWER

Page 12

Find the area of the segment shaded red



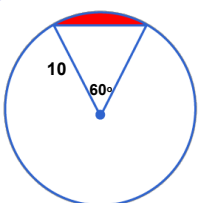
Area of sector = Area of triangle =

Area of segment =

HINT

Page 13

Find the area of the segment shaded red



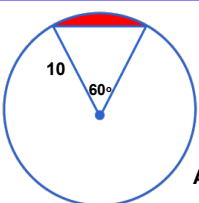
Area of sector = $\frac{1}{6}\pi(10^2)$

Area of triangle = $\frac{1}{2}(10)(5\sqrt{3})$

ANSWER

Page 14

Find the area of the segment shaded red



Area of sector = $\frac{1}{6}\pi(10^2)$
Simplify Numerically:
52.36

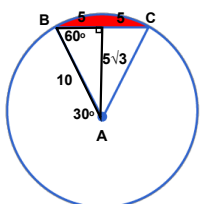
Area of triangle = $\frac{1}{2}(10)(5\sqrt{3})$
Simplify Numerically:
43.301

Area of segment = $52.36 - 43.301$
Simplify Numerically:
9.059

Page 15

Finding the area of the triangle

Use could use 30°-60°-90° triangle ratios to find the dimensions of the missing sides.



Area of triangle ABC = $\frac{1}{2}(10)(5\sqrt{3})$

BACK

Hint for Page 13

1 How much more cookie is in a 14-in diameter cookie cake than in a 4-in diameter cookie? **Multiple choice**

A 31.4 in²

B 56.5 in²

C 103.62 in²

D 204.1 in²

Dec 13-3:02 AM

2 How much more does a 12-in. diameter dinner plate hold than an 8-in. plate? **Multiple choice**

A 6.28 in²

B 12.56 in²

C 31.4 in²

D 62.8 in²

Dec 13-3:02 AM

3

Find the area of sector AOB in terms of pi.

Multiple choice

A

3.75π cm²

B

7.5π cm²

C

56.25π cm²

D

176.63π cm²

Dec 13-3:02 AM

4

Find the area of sector AOB in terms of pi.

Multiple choice

A

170.8π cm²

B

54.4π cm²

C

9.07π cm²

D

4.53π cm²

Dec 13-3:02 AM

5

Find the area of sector AOB in terms of pi.

Multiple choice

A

3.6π cm²

B

7.2π cm²

C

64.8π cm²

D

203.47π cm²

Dec 13-3:02 AM

6

Find the area of sector AOB in terms of pi.

Multiple choice

A

10.7π cm²

B

85.3π cm²

C

21.3π cm²

D

42.7π cm²

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7

Find the area of the shaded region to the nearest tenth.

Numeric

Dec 13-3:02 AM

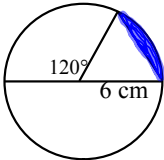
8

Find the area of the shaded region to the nearest tenth.

Numeric

Dec 13-3:02 AM

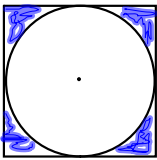
9 Find the area of the shaded region to the nearest tenth. Numeric



Dec 13-3:02 AM

10 What is the area of the shaded region? Multiple choice

- A 7.74 ft²
- B 15.48 ft²
- C 26.58 ft²
- D 77.04 ft²



Dec 13-3:02 AM

Attachments

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