Geometry Unit 8 Day 1 and 2 Area of Parallelograms and triangles

Learning Target – Students will find the area of parallelograms and triangles.

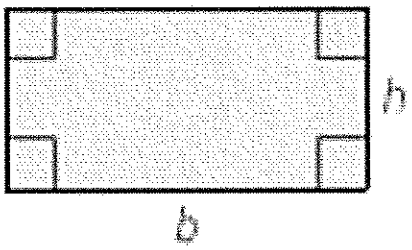
Investigation

1. Cut out a rectangle from grid paper by cutting along grid lines.
2. Record the base, height and area of the rectangle.
3. Cut out a right triangle from one end of the rectangle. Tape the triangle to the opposite end of the rectangle to form a parallelogram.
4. Compare and contrast the original rectangle with the parallelogram you formed.

Area of a Rectangle

– The area of a rectangle is the product of its base and height.

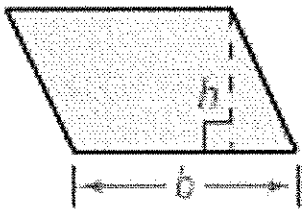
– A = bh



Area of a Parallelogram

The area of a parallelogram is the product of a base and the corresponding height.

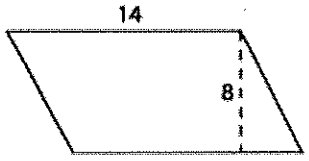
A = bh



You Try:

For problems 6 – 8, find the area of the following parallelograms.

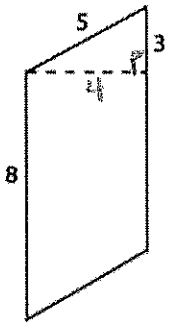
6.



$A = bh = 14(8) = 112$

Area = $112\ in^2$

7.



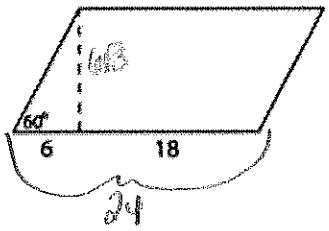
$3^2 + h^2 = 5^2$

$h = 4$

So $A = 8 \cdot 4 = 32$

Area = $32\ in^2$

8.



$A = bh$

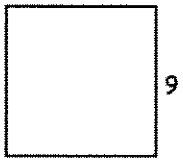
$= 24(6\sqrt{3})$

$= 144\sqrt{3}$

Area = $144\sqrt{3}\ un^2$

For problems 1 – 2, find the area of the following squares.

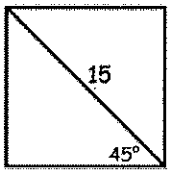
1.



$A = bh$

Area = $9 \cdot 9 = 81$ un^2

2.



$\frac{15}{1} = \frac{15\sqrt{2}}{2}$

$A = bh = \frac{15\sqrt{2}}{2} \cdot \frac{15\sqrt{2}}{2}$

$= \frac{225 \cdot 2}{4}$

$= \frac{225}{2}$

Area = $\frac{225}{2}$ un^2

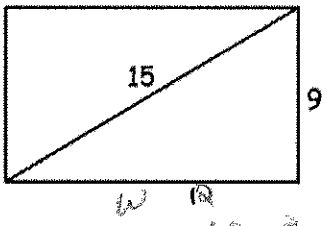
For problems 3 – 5, find the area of the following rectangles.

3.

$bh = 8 \cdot 3$

Area = 24 un^2

4.



Area = 108 un^2

$9^2 + w^2 = 15^2$

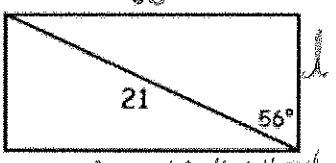
$w^2 = 144$

$w = 12$

$A = 9 \cdot 12$

$= 108$

5.



$\sin 56 = \frac{w}{21}$

$w = 17.41$

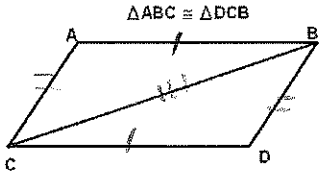
$\cos 56 = \frac{l}{21}$

$l = 11.74$

$A = lw = 17.41 \times 11.74$

Area = 204.45 un^2

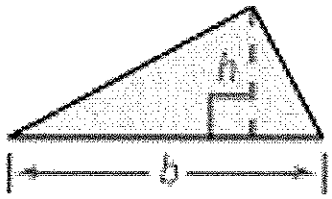
You know the property of a parallelogram that says a diagonal divides it into two congruent triangles.



5. Why is this true? SSS
6. How could this property help you determine the formula for the area of a triangle? it's just half of the shape

The area of a triangle is half the product of a base and the corresponding height.

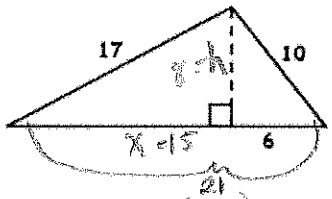
$$A = \frac{1}{2}bh$$



Add an easy one with base + height given!

7. Find each area.

6.



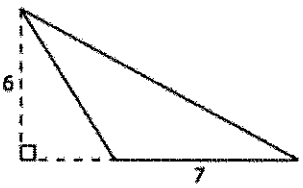
Area = 84 un²

$A = \frac{1}{2}bh$
$= \frac{1}{2}(21)(8)$
$= 84$

$8^2 + x^2 = 17^2$
$x = 15$

$10^2 = 6^2 + h^2$
$h = 8$

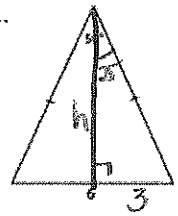
1.



Area = 21 un²

$A = \frac{1}{2}(7)(6)$

11.

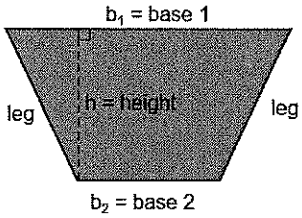


Area = 19.30 un²

$\tan 25 = \frac{3}{h}$
$h = 6.43$

$A = \frac{1}{2}bh = \frac{1}{2}(6)(6.43)$

Trapezoids:



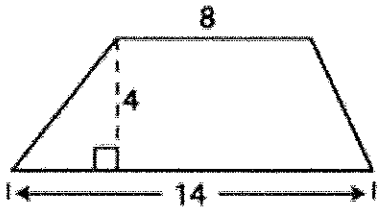
Height – distance between the 2 bases.

* Must be ⊥

Area of trapezoid: $A = \frac{1}{2}h(b_1 + b_2)$ (base, base; Height)

Find the area of the following figures.

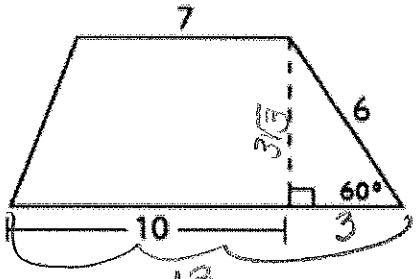
2.



Area = 44 un²

$A = \frac{1}{2}(b_1 + b_2)h$
$= \frac{1}{2}(8 + 14)4$
$= 44$

4.



Area = 30√3 un²

$A = \frac{1}{2}(b_1 + b_2)h$
$= \frac{1}{2}(13 + 7)3\sqrt{3}$
$= 30\sqrt{3}$

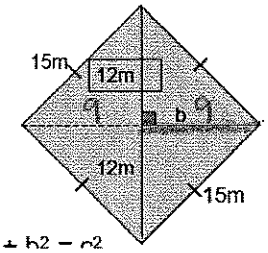
Area of a Rhombus or a Kite

Area of Kites or Rhombi → $A = \frac{1}{2} d_1 d_2$

Diagonal One, Diagonal Two

* Add an easy one w/ given diagonals given

Find each area.

1. 

$a^2 + b^2 = c^2$

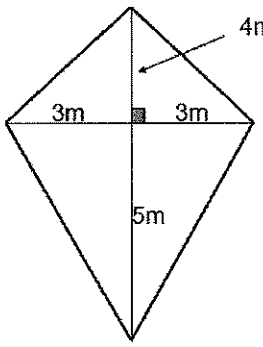
$b^2 + 12^2 = 15^2$

$b = 9$

$A = \frac{1}{2} d_1 \cdot d_2$

$= \frac{1}{2}(24)(18)$

$= 216 m^2$

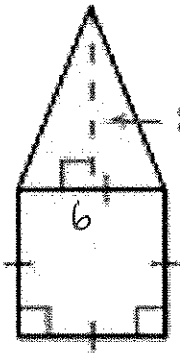
2. 

$A = \frac{1}{2} d_1 \cdot d_2$

$= \frac{1}{2}(9)(6)$

$= 27 m^2$

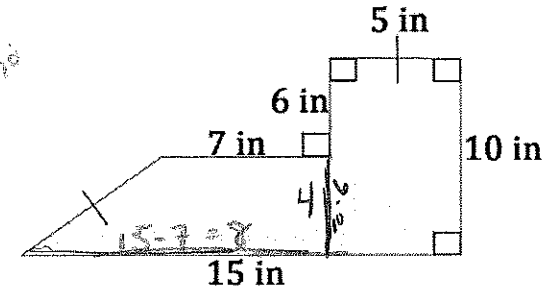
* Add some directions about area of composite shapes

3. 

$A_\Delta = \frac{1}{2} bh = \frac{1}{2}(6)(8) = 24 in^2$

$A_\square = bh = 6 \cdot 6 = 36 in^2$

$A_{whole} = 24 + 36 = 60 in^2$

4. 

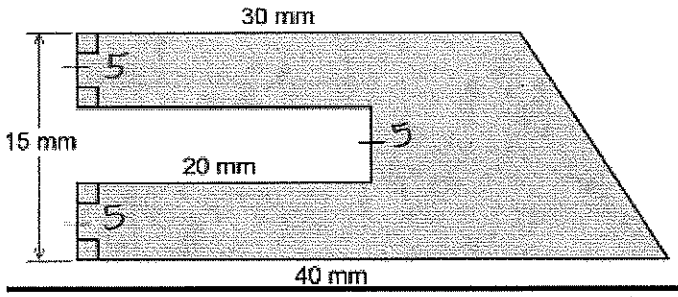
$Area_\square = l \cdot w = 5 \cdot 10 = 50$

$Area_\Delta = \frac{1}{2}(b_1 + b_2)h$

$= \frac{1}{2}(7 + 8)(4)$

$= 30$

$Area_{white} = 50 - 30 = 20 in^2$

5. 

$A_{trapezoid} = \frac{1}{2}(b_1 + b_2)h$

$= \frac{1}{2}(30 + 40)15$

$= 525 mm^2$

$A_{rectangle} = l \cdot w = 5 \cdot 20 = 100$

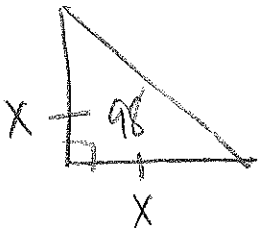
$A_{shaded} = trap - rectangle = 525 - 100 = 425 mm^2$

* Add one that's a square with missing corner

f. The area of a parallelogram is 24 in^2. The height is 6 in. Find the length of the base.

$A = bh$
$24 = b(6)$
$4\text{in} = b$

g. An isosceles right triangle has area of 98 in^2. Find the length of each leg.



$A = \frac{1}{2}bh$
$98 = \frac{1}{2}x^2$
$\sqrt{196} = \sqrt{x^2}$
$14 = x$

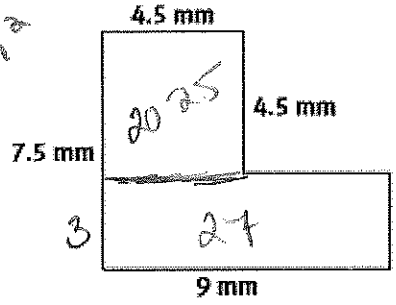
each leg is 14in.

Geometry Unit 8 Day 1 and 2 HW

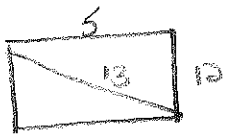
7. Find the area of the composite figure shown. A= 471.25mm²

8. Determine the area and perimeter of a rectangle with length 12 cm and diagonal length 13 cm. 60cm²

9. Determine the area and perimeter of the parallelograms shown. Round the answers to the nearest tenth.

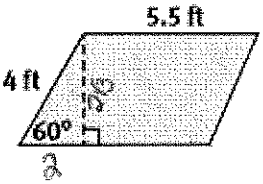


8.)

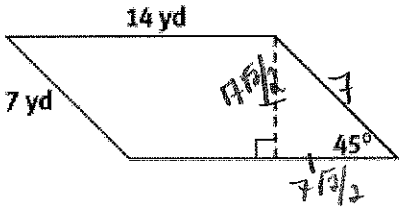


a.

A = 111.3ft²
P = 19 ft

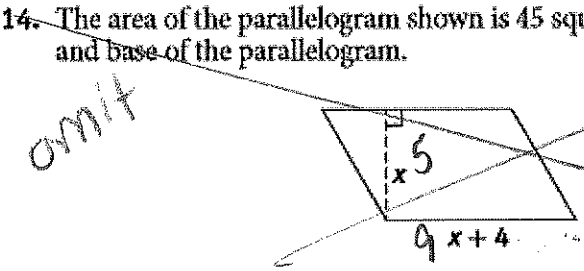


b.



A = 49√2 yd²
P = 42yd

14. The area of the parallelogram shown is 45 square units. Find the height and base of the parallelogram.



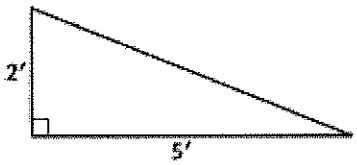
omit

x(x+4) = 45
x² + 4x − 45 = 0
(x + 9)(x − 5) = 0
x = −9 x = 5

15. The cost for a table top is $8.50 per square foot.

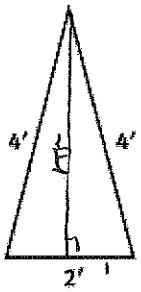
Find the area and subsequent charge for each tabletop below.

a.



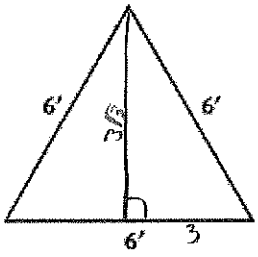
$42.50

b.



$32.92

c.



$132.50

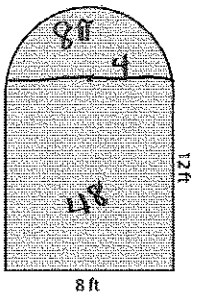
16. The area of an isosceles trapezoid is 54 square cm. The perimeter is 32 cm. If a leg is 7 cm long, find the height of the trapezoid.

54 = ½(18)h
h = 6

Find each area.

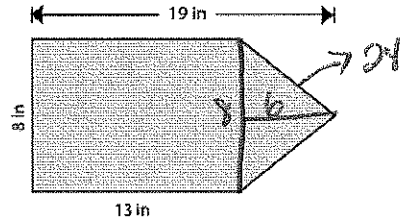
Find the area of each figure. Round the answer to 2 decimal places if necessary.

1)



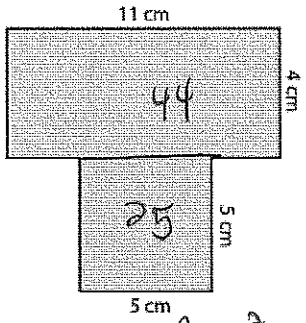
Area = 73.13ft

2)



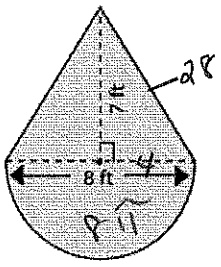
Area = 128 in²

3)



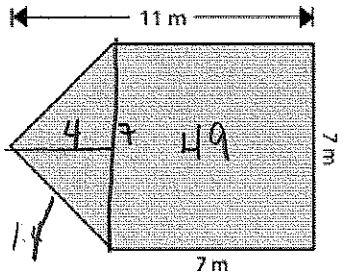
Area = 69cm²

4)



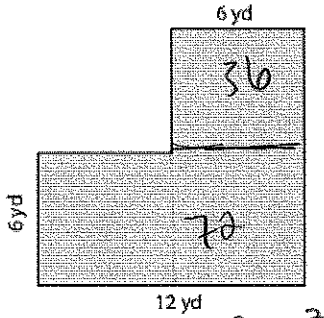
Area = 53.13ft²

5)



Area = 63m²

6)



Area = 108 yd²

Geometry Unit 8 Day 3 Area of regular polygons

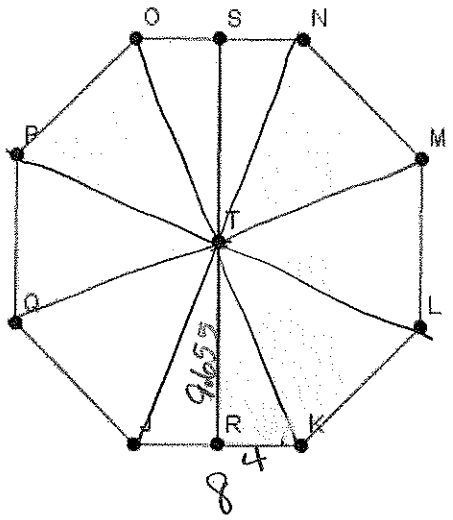
Learning Target- Students will find the area of regular polygons

What does it mean for a polygon to be regular?

all sides = .

The polygon below is a regular octagon with a perimeter of 64 m. Segment SR has a length of 19.31 m. Find the area of the polygon.

Show all work. Be prepared to share your results with the class.



A of 1 Δ = $\frac{1}{2}bh$

$= \frac{1}{2}(8)(9.65)$

$= 38.6\,a$

8 Δ's = 38.62 × 8

$= 308.96\,m^2$

Based on your results, write a method for determining the area of a regular polygon. Be prepared to share your method with the class.

Find the area of each Δ then × by the # of Δ's.

n = # of sides

Formula for find the area of a regular polygon =

$A = \frac{1}{2}Pa$ ← apothem

perimeter

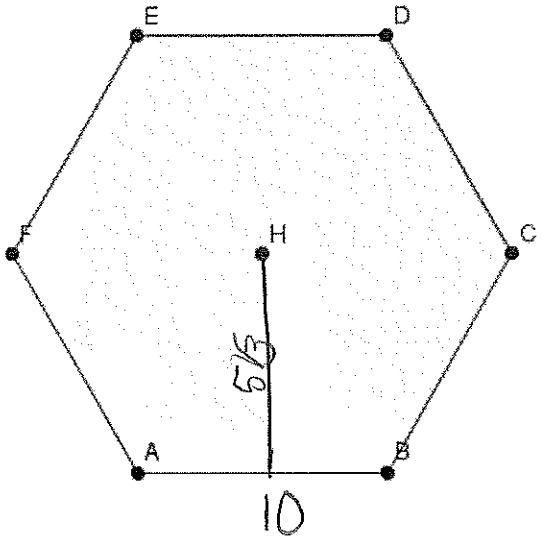
since $\left(\frac{1}{2}bh\right)n$

$= (bn)a\,\frac{1}{2}$

$= \frac{1}{2}Pa$

ABCDEF below is a regular hexagon with a perimeter of 60cm. Find the area of ABCDEF.

Show all work. Be prepared to share your solution with the class.



$A = \frac{1}{2}Pa$

$= \frac{1}{2}(60)(5\sqrt{3})$

$= 259.81\ cm^2$

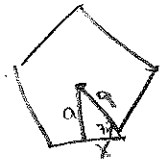
How does the problem on the front of the page differ from the problem on the back of the page? How are they the same?

- the Δ's are 30-60-90's here.
- the apothem is not given, you have to find it.

10 Do together

Practice:

1. Find the area of a regular pentagon with a radius of 9 m.



$\sin 72 = \frac{a}{9}$ $\quad a = 8.5595$

$\cos 72 = \frac{x}{9}$ $\quad x = 2.781$

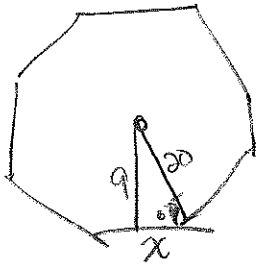
side $= 5.562$

perimeter $= 27.812$

$A = \frac{1}{2}Pa = \frac{1}{2}(27.812)(8.5595)$

$= 119.03 m^2$

2. Find the area of a regular octagon with a radius of 20 inches.



$\sin 67.5 = \frac{9}{20}$ $\quad a = 18.478$

$\cos 67.5 = \frac{x}{20}$ $\quad x = 7.654$

side $= 15.307$

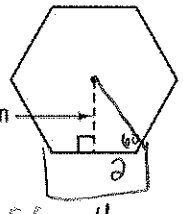
perimeter $= 122.459$

$A = \frac{1}{2}Pa = \frac{1}{2}(122.459)(18.478)$

$A = 1131.33 in^2$

3. **Error Analysis** To find the area of the regular hexagon at the right with apothem $2\sqrt{3}$, a classmate uses the value 12 for the perimeter. What is your classmate's error?

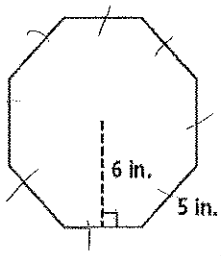
The perimeter is actually 24. The side of the Right $\triangle$ is 2 but the side of the hexagon is 4. So the perimeter is 24



Geometry Unit 8 day 3 HW

Find the area of each regular polygon to the nearest square inch.

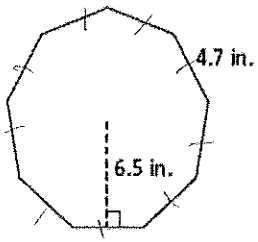
10.



$A = \frac{1}{2}Pa = \frac{1}{2}(40)(6)$

$= 120\ in^2$

11.

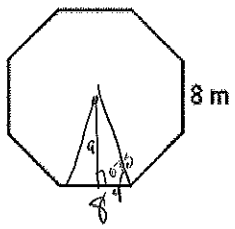


$A = \frac{1}{2}Pa = \frac{1}{2}(42.3)(6.5)$

$= 137.475\ in^2$

Find the area of each regular polygon. Round your answers to the nearest tenth.

1



$\tan 67.5 = \frac{a}{4}$

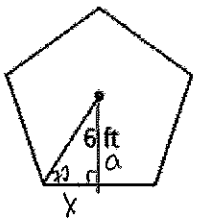
$a = 9.657$

$A = \frac{1}{2}Pa$

$= \frac{1}{2}(64)(9.657)$

$= 309.019\ m^2$

2.



$\cos 72 = \frac{x}{6}$ $\quad \sin 72 = \frac{a}{6}$

$x = 1.85$ $\quad a = 5.706$

$2x = 3.708$

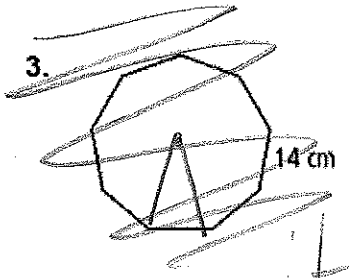
$P = 18.54$

$A = \frac{1}{2}Pa$

$= \frac{1}{2}(18.54)(5.706)$

$= 52.897\ ft^2$

3.



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Geometry Unit 5 Day 6 Area on coordinate grid

Learning Target – students will use the coordinate grid to find area.

1. Points $F(-3, 4)$, $G(2, 2)$, $H(2, -4)$, and $J(-3, -2)$ are the vertices of parallelogram $FGHJ$.

a. Draw the parallelogram on the grid.

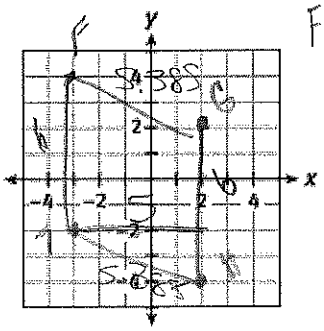
b. Determine the perimeter of the parallelogram to the nearest tenth.

$P = 6 + 6 + 5.385 + 5.385$

$= 22.77$ un

c. What is the area of the parallelogram?

$A = 5 \cdot 6 = 30 \text{ un}^2$



$FG = \sqrt{(2-4)^2 + (2+3)^2}$

$= \sqrt{(-2)^2 + (5)^2}$

$= \sqrt{4 + 25}$

$= \sqrt{29} = 5.385$

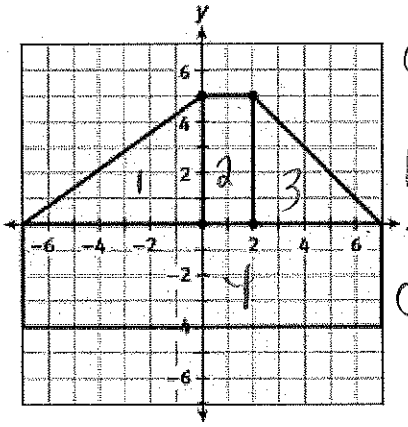
2. Find the area of the tabletop shown on the coordinate plane.

a. Name the shapes that make up the tabletop.

b. Critique the reasoning of others. Jalen and Bree each used a different method to determine the area of the tabletop. Jalen found the sum of the areas of each of the four figures. Bree drew auxiliary lines to create a large rectangle, and then subtracted the area of the two triangular regions not in the tabletop from the large rectangle. Whose method is correct? Explain your reasoning.

c. Compute the area of the tabletop.

d. What are some benefits of working with composite figures on a coordinate plane? Easier to find the side lengths



a.) 2 Δ's and 2 rectangle's.

b.) Both will work.

c.) $A_1 = \frac{1}{2}bh$

$= \frac{1}{2}(7)(5) = 17.5$

$A_2 = bh = 2 \cdot 5 = 10$

$A_3 = \frac{1}{2}bh = \frac{1}{2}(5)(5) = 12.5$

$A_4 = bh = 14(4) = 56$

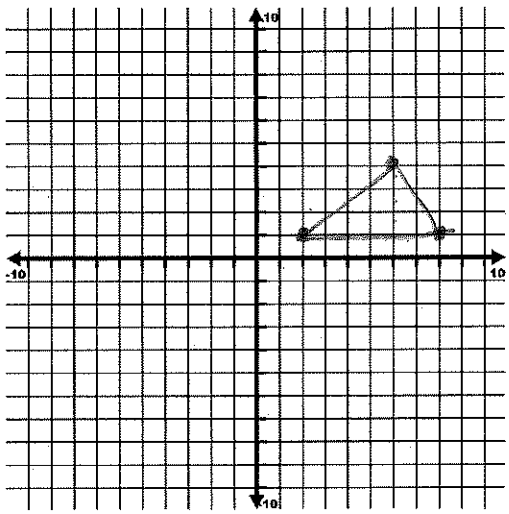
$A_{whole} = 96 \text{ un}^2$

3. Find the area of

Triangle ABC with vertices at (2, 1), (8, 1), and (6, 4)

$A = \frac{1}{2}bh$

$= \frac{1}{2}(6)(3) = 9 \text{ un}^2$



Geometry Unit 8 Day 6 HW

1.

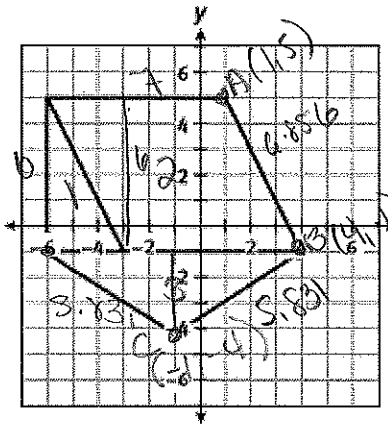
Make sense of problems. Determine the perimeter and area of the tabletop shown on the coordinate plane below.

$Area_1 = \frac{1}{2}bh = \frac{1}{2}(3)(6) = 9$

$Area_2 = bh = 6(7) = 42$

$Area_3 = \frac{1}{2}bh = \frac{1}{2}(10)(3) = 15$

$Area_{whole} = 9 + 42 + 15 = 66$



$d_{AB} = \sqrt{(1-5)^2 + (5-1)^2}$

$= \sqrt{(-4)^2 + 4^2}$

$= \sqrt{16+9} = \sqrt{97} = 6.856$

$d_{BC} = \sqrt{(-4-1)^2 + (-1-5)^2}$

$= \sqrt{(-5)^2 + (-6)^2}$

$= \sqrt{61+25}$

$= \sqrt{34} = 5.831$

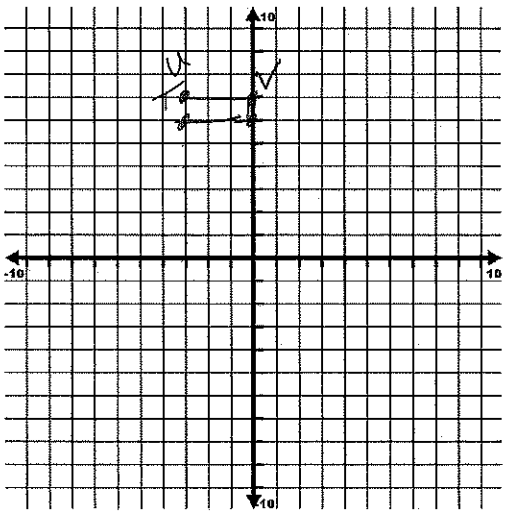
Find the area of:

4. Figure $TUVW$ with vertices $T(-3, 6)$, $U(-3, 7)$, $V(0, 7)$, and $W(0, 6)$

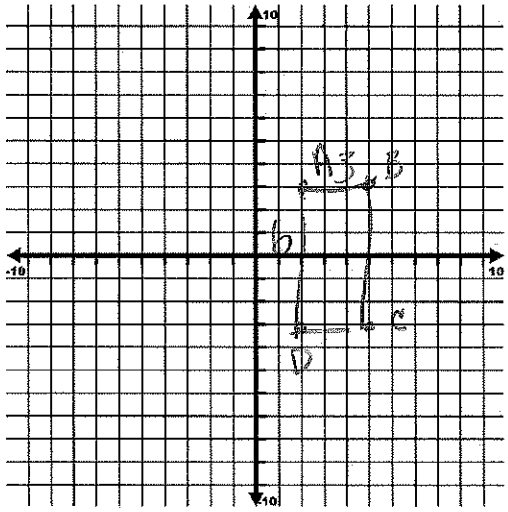
6. What is the perimeter of Figure $ABCD$ with vertices at $A(2, 3)$, $B(5, 3)$, $C(5, -3)$, and $D(2, -3)$? What is the area?

$P = 6 + 7 + 6.856 + 5.831 + 5.831$

$= 31.518$ un.



$A = bh = 3(1) = 3 \text{ un}^2$



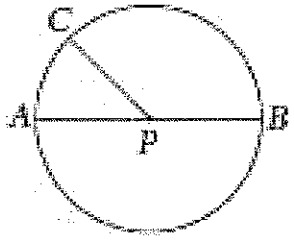
$P = 6 + 6 + 3 + 3 = 18$ un.

$A = bh = 6 \cdot 3 = 18$ un

Geometry Unit 8 Day 7 Circumference and Arc Length

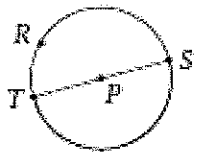
Learning target – Students will find the circumference of a circle and the length of an arc.

- A circle is a set of points equidistant from a given point called the center.
- A radius is a segment that has one endpoint at the center and the other endpoint on the circle.
- A diameter is a segment that contains the center of the circle and has both endpoints on the circle.
- A central angle is an angle whose vertex is the center of the circle.
- Congruent circles have congruent radii.

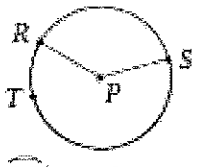


1. Name a radius. $\overline{AP}$ or $\overline{BP}$
2. Name a diameter $\overline{AB}$
3. Name the circle. $\odot P$
4. Name a central angle. $\angle APC$ or $\angle BPC$

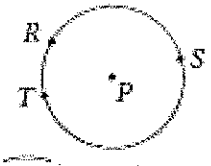
An arc is a part of a circle. One type of arc, a **semicircle,** is half of a circle. A **minor arc** is smaller than a semicircle. A **major arc** is greater than a semicircle.



$\overset{\frown}{TRS}$ is a semicircle.
$m\overset{\frown}{TRS} = 180$

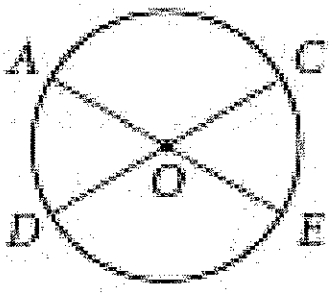


$\overset{\frown}{RS}$ is a minor arc.
$m\overset{\frown}{RS} = m\angle RPS$



$\overset{\frown}{RTS}$ is a major arc.
$m\overset{\frown}{RTS} = 360 - m\overset{\frown}{RS}$

5. Identify a minor arc. $\overset{\frown}{AC}$
6. Identify a major arc that contains point A. $\overset{\frown}{DAE}$
7. Identify a semicircle. $\overset{\frown}{DAC}$



Adjacent arcs are arcs of the same circle that have exactly one point in common. You can add the measures of adjacent arcs just as you can add the measures of adjacent angles.

Postulate 10-1 **Arc Addition Postulate**

The measure of the arc formed by two adjacent arcs is the sum of the measures of the two arcs.

$$m\overset{\frown}{ABC} = m\overset{\frown}{AB} + m\overset{\frown}{BC}$$

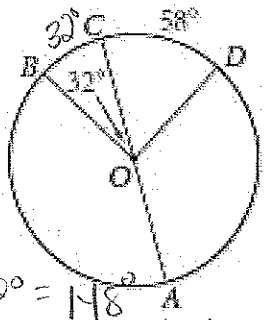
8. Find the measure of each arc.

a. $\overset{\frown}{BC}$ 32°

b. $\overset{\frown}{BD}$ 32+58=90°

c. $\overset{\frown}{ABC}$ 180°

d. $\overset{\frown}{AB}$ 180-32° = 148°



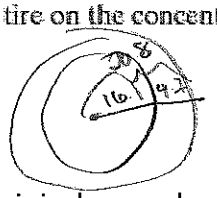
9. What is circumference? The distance around a circle

10. What formula can you use to find circumference? Explain how you know.

11. Can this formula be written in another way?

Circles that lie in the same plane and have the same center are **concentric circles.**

12. **Automobiles** A car has a turning radius of 16.1 ft. The distance between the two front tires is 4.7 ft. In completing the (outer) turning circle, how much farther does a tire travel than a tire on the concentric inner circle?



C outer = 20.8π

C inner = 16.1π

Subtract!

4.7π = 14.765 feet

for them

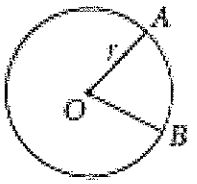
13. The measure of an arc is in degrees, however the length of an arc is a fraction of a circles circumference. So what unit would it be measured in? feet, inches, etc

14. If an arc is 60 degrees, what fraction of the entire circle does that represent? 60/360 = 1/6

Theorem 10-10 **Arc Length**

The length of an arc of a circle is the product of the ratio $\frac{\text{measure of the arc}}{360}$ and the circumference of the circle.

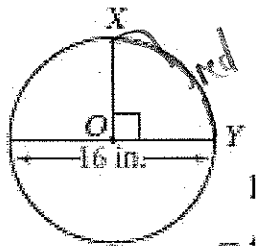
$$\text{length of } \overset{\frown}{AB} = \frac{m\overset{\frown}{AB}}{360} \cdot 2\pi r$$



15. Find the length of each arc shown in red. Leave your answer in terms of π.

360 − 240 = 120°

a.



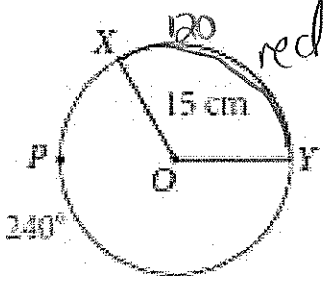
$\frac{n}{360} \cdot 2\pi r$

$\frac{90}{360} \cdot 16\pi$

$\frac{1}{4} \cdot 16\pi$

4π

b.



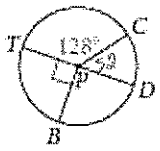
$\frac{A}{360} \cdot 2\pi r$

$\frac{120}{360} \cdot 2\pi(15)$

$\frac{1}{3}(30\pi)$

10π

Geometry Unit 8 Day 7 HW



Find the measure of each arc in ⊙P.

15. $\overline{TC}$ 128°

16. $\overline{TBD}$ 180°

19. $\overline{CD}$ 52°

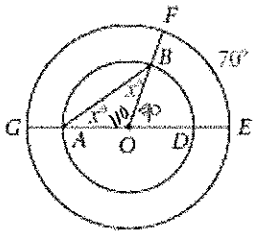
23. $\overline{TDC}$ 232°

20. $\overline{CBD}$ 270°

70. The two circles shown below are concentric.

a. Name two arcs that have the same measure. BD → FE

b. Find the value of x. x = 35°



33. The wheel of an adult's bicycle has diameter 26 in. The wheel of a child's bicycle has diameter 18 in. To the nearest inch, how much farther does the larger bicycle wheel travel in one revolution than the smaller bicycle wheel?

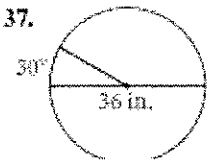
$26\pi = C_{big}$

$18\pi = C_{small}$

difference = 25.1 in

Find the length of each arc shown in red. Leave your answer in terms of π.

37.

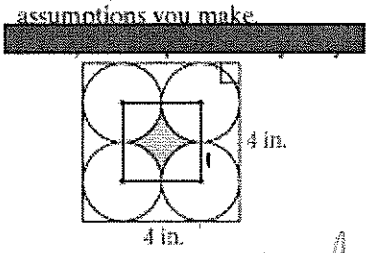


$\frac{30}{360} \cdot 36\pi$

$\frac{1}{12} \cdot 36\pi$

3π

71. Find the perimeter of the shaded portion of the figure below. Leave your answer in terms of π. Explain your reasoning and state what assumptions you make.



π b/c 1/4 of each O, two to equal whole O.

~~51. What is the measure of the angle formed by the hands of a clock at 7:20?~~

The circumference of a circle is 100π.

54. find the diameter of the circle. 100

55. Find the radius of the circle. 50

Previous Page

56. Find the length of an arc with a measure of 120 degrees. and radius of 3

$\frac{120}{360} \cdot 6\pi$

$= 2\pi$

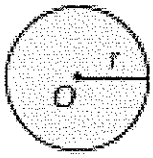
Geometry Unit 8 Day 8 Area of sectors

Learning Target - Students will find the area of sectors of circles

Theorem 10-11 Area of a Circle

The area of a circle is the product of π and the square of the radius.

$$A = \pi r^2$$



1. Food How much more pizza is in a 12-in.-diameter pizza than in a 10-in. pizza?

$A = 6^2\pi \quad A = 5^2\pi$

$36\pi - 25\pi = 11\pi \text{ in}^2$

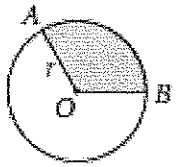
A **sector of a circle** is a region bounded by an arc of the circle and the two radii to the arc's endpoints. You name a sector using one arc endpoint, the center of the circle, and the other arc endpoint. The slice of pizza at the left is sector XOY of a circle O.

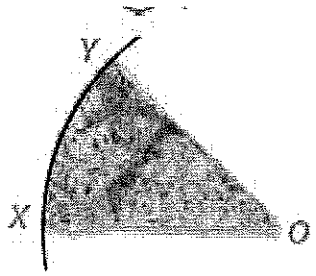
The area of a sector is a fractional part of the area of a circle. The ratio of a sector's area to a circle's area is $\frac{\text{measure of the arc}}{360}$.

Theorem 10-12 Area of a Sector of a Circle

The area of a sector of a circle is the product of the ratio $\frac{\text{measure of the arc}}{360}$ and the area of the circle.

$$\text{Area of sector } AOB = \frac{m\overset{\frown}{AB}}{360} \cdot \pi r^2$$



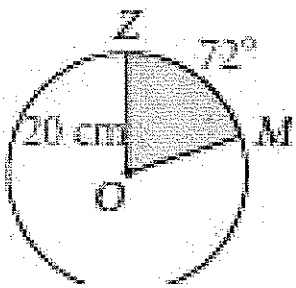


2. Find the area of sector ZOM. Leave your answer in terms of π.

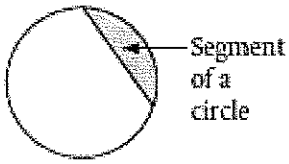
$\frac{72}{360}\pi(20)^2$

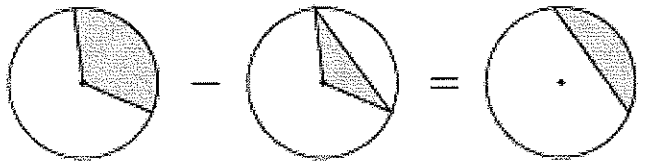
$\frac{1}{5} \cdot 400\pi$

$80\pi \text{ cm}^2$



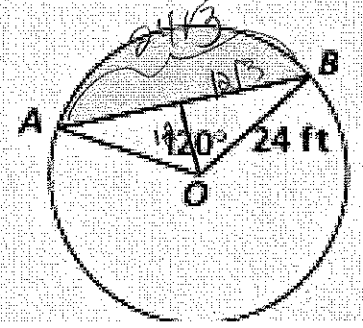
A part of a circle bounded by an arc and the segment joining its endpoints is a **segment of a circle.** To find the area of a segment for a minor arc, draw radii to form a sector. The area of the segment equals the area of the sector minus the area of the triangle formed.





Area of sector — Area of triangle = Area of segment

E Find the area of the shaded segment. Round your answer to the nearest tenth.



Area of segment

$= \frac{n}{360} \cdot \pi r^2 - \frac{1}{2}bh$

$= \frac{120}{360}(24)^2\pi - \frac{1}{2}(12)(24\sqrt{3})$

$= 192\pi - 144\sqrt{3}$

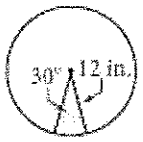
Geometry Unit 8 Day 8 HW

5. **Agriculture** Some farmers use a circular irrigation method. An irrigation arm acts as the radius of an irrigation circle. How much more land is covered with an irrigation arm of 300 ft than by an irrigation arm of 250 ft? $300^2\pi - 250^2\pi = 27500\pi$

6. What is the difference in the areas of a circular table with diameter 6 ft and a circular table with diameter 8 ft? $4^2\pi - 3^2\pi = 7\pi$

Find the area of each shaded sector of a circle. Leave your answer in terms of π.

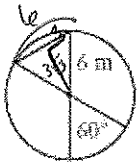
10.



$\frac{30}{360} \cdot 12^2\pi = 12\pi$

Find the area of each shaded segment. Round your answer to the nearest tenth.

19.

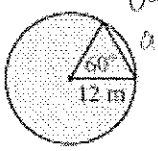


$\frac{60}{360}\ 36\pi - \frac{1}{2}(6)(3\sqrt{3})$

$6\pi - 9\sqrt{3}$

Find the area of the shaded region. Leave your answer in terms of π and in simplest radical form.

24.

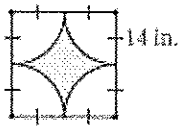


Area circle $= 144\pi$

area segment $= \frac{1}{6}(144\pi) - \frac{1}{2}(12)(6\sqrt{3})$

$24\pi - 36\sqrt{3}$

27.



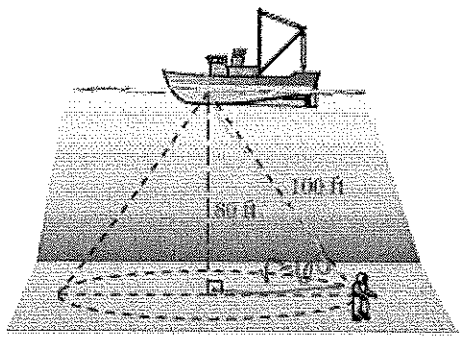
Area square $= 784$

Area $O = 196\pi$

Shaded $= 784 - 196\pi$

28. Multiple Choice The diver at the right is collecting samples from the ocean floor. The line to the diver is 100 ft long, and the diver is working at a depth of 80 ft. What is the approximate area of the circle that the diver can cover?

Ⓐ 11,300 ft^2 Ⓑ 25,400 ft^2
Ⓒ 31,400 ft^2 Ⓓ 51,400 ft^2



$r^2 + 80^2 = 100^2$

$r = 60$

$A = \pi(60)^2 = 11309.73$

31. Games A dart board has diameter 20 in. and is divided into 20 congruent sectors. Find the area of one sector. Round your answer to the nearest tenth.

$\frac{1}{20} \cdot 100\pi = 5\pi = 15.7\text{in}^2$

Need P

32. In a circle, a 90° sector has area 36π in.^{2}. What is the circle's radius?

$144\pi = \pi r^2$

$r = 12$

Geometry Unit 8 Day 10 Geometric Probability

Learning Target – Students will find geometric probability

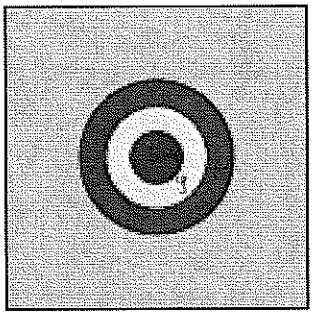
$$P(\text{event}) = \frac{\text{favorable outcomes}}{\text{possible outcomes}}$$

Geometric probability

$$P(\text{event}) = \frac{\text{area of favorable region}}{\text{area of entire region}}$$

Example:

Target Game Assume that a dart you throw will land on the 1-ft square dartboard and is equally likely to land at any point on the board. Find the probability of hitting each of the blue, yellow, and red regions. The radii of the concentric circles are 1, 2, and 3 inches, respectively.



$A_{Board} = 144$

$A_{Blue} = \pi 1^2 = \pi$

$A(yellow) = 4\pi - 1\pi = 3\pi$

$A(red) = 9\pi - 4\pi = 5\pi$

$P(Blue) = \frac{\pi}{144}$

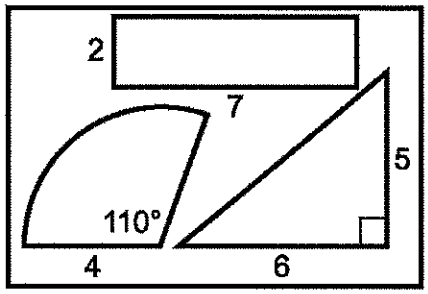
$P(yellow) = \frac{3\pi}{144}$

$P(red) = \frac{5\pi}{144}$

You try:

For a carnival game, a person chooses 1 of 3 shapes on a rectangular board: a sector of a circle, a rectangle, and a triangle. Then, 1 point on the board is selected at random and lights up. If the point is within the shape the player chose, he or she wins a prize.

A.) The sector has the greatest area so she should choose it
$P(\text{rect}) = \frac{14}{96} = .146 = 14.6\%$
$P(\Delta) = \frac{15}{96} = 15.6\%$
$P(\text{sector}) = \frac{\frac{44}{9}\pi}{96} = 16.0\%$



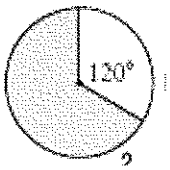
Area (whole) $= 12 \cdot 8 = 96$
Area (rect.) $= 2 \cdot 7 = 14$
Area (Δ) $= \frac{1}{2}(6)(5) = 15$
Area (sector) $= \frac{110}{360} \cdot \pi(6^2) = \frac{44}{9}\pi$
$= 15.35$

A. Which of the 3 shapes should Keisha choose to have the greatest probability of winning? Find the probability, to the nearest tenth of a percent, of winning for each of the 3 shapes. Show your work, and explain how you found your answer.

B. Keisha, JoAnna, and Ricardo play the game at the same time and each chooses a different shape. To the nearest tenth of a percent, what is the probability that none of them will win? Show your work algebraically, and explain how you found your answer. $96 - 14 - 15 - \frac{44}{9}\pi = 81.69$ $P(\text{no winner}) = \frac{81.69}{96} = 53.8\%$

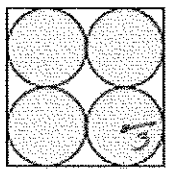
Geometry Unit 8 Day 10 HW

1.) Find the probability that a dart thrown at the target will land in the shaded region.



2/3

2.)



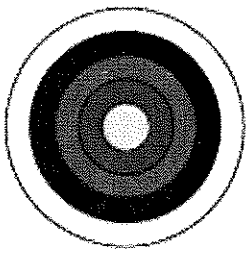
$(9\pi)4 = 36\pi$ = area of O's
area of square $= 36$
$\frac{36\pi}{36} = \pi$

3.) Suppose a bus arrives at a bus stop every 25 minutes and waits 5 minutes before leaving. Sketch a geometric model. Use it to find the probability that a person has to wait more than 10 minutes for a bus to leave.

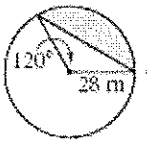
4.)

. Archery An archery target with a radius of 61 cm has 5 scoring zones formed by concentric circles. The colors of the zones are yellow, red, blue, black, and white. The radius of the yellow circle is 12.2 cm. The width of each ring is also 12.2 cm. If an arrow hits the target at a random point, what is the probability that it hits the

Outer white ring?



51. The radius of a circle is 28 m. The measure of the central angle is 120.



a. Find the area of the sector in terms of π. Justify your answer.

b. Find the area of the shaded segment to the nearest tenth. Justify your answer.