

Name: Key

Date: \_\_\_\_\_

### Unit 8a Review Sheet

1. Define the following:

a) Acute Triangle- a  $\Delta$  with all angles less than  $90^\circ$

b) Obtuse Triangle- a  $\Delta$  with one angle greater than  $90^\circ$

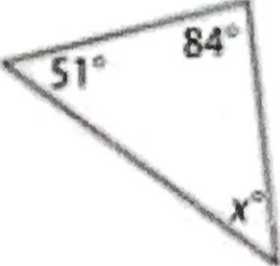
c) Right Triangle- a  $\Delta$  with one angle measuring  $90^\circ$

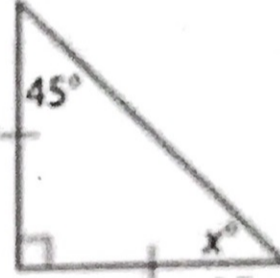
d) Equilateral Triangle- a  $\Delta$  with all equal sides

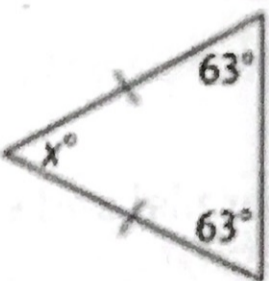
e) Isosceles Triangle- a  $\Delta$  with at least two equal sides

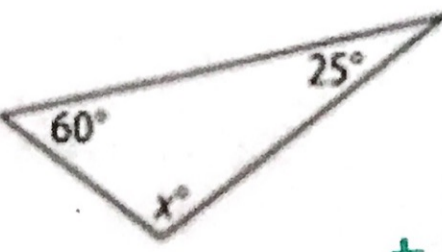
f) Scalene Triangle- a  $\Delta$  with no equal sides

2. Find the value of  $x$  and classify each triangle by its angles and sides.

a)  
$$\begin{array}{r} 51 \\ +84 \\ \hline 135 \end{array} \quad \begin{array}{r} 180 \\ -135 \\ \hline x=45^\circ \end{array} \quad \text{Acute scalene}$$

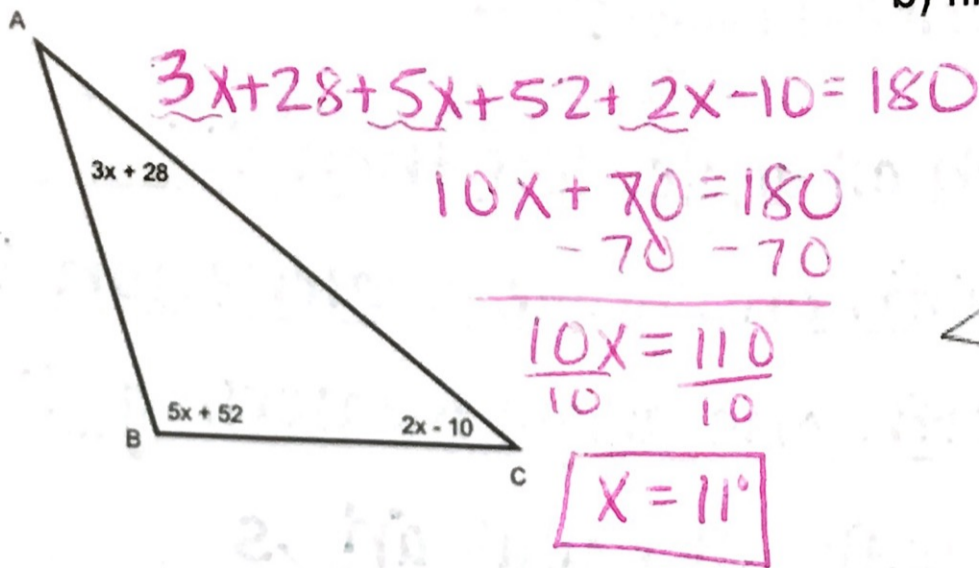
b)  
$$\begin{array}{r} 45 \\ +90 \\ \hline 135 \end{array} \quad \begin{array}{r} 180 \\ -135 \\ \hline x=45^\circ \end{array} \quad \text{Right Isosceles}$$

c)  
$$\begin{array}{r} 63 \\ +63 \\ \hline 126 \end{array} \quad \begin{array}{r} 180 \\ -126 \\ \hline x=54^\circ \end{array} \quad \text{Acute Isosceles}$$

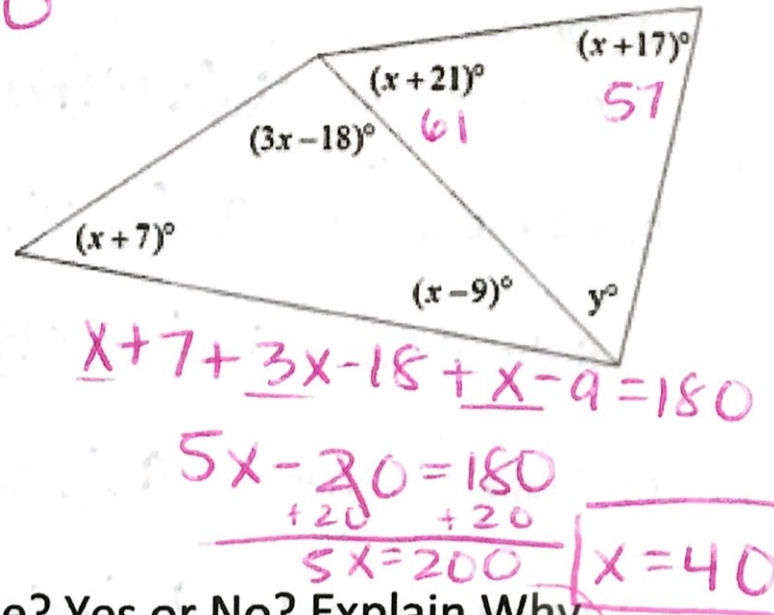
d)  
$$\begin{array}{r} 60 \\ +25 \\ \hline 85 \end{array} \quad \begin{array}{r} 180 \\ -85 \\ \hline x=95^\circ \end{array} \quad \text{Obtuse Scalene}$$

3. Solve algebraically for the value of x and y in the triangles below. Show ALL work.

a)



b) hint... first, find x in the LEFT triangle.



4. Can the following lengths/angles form a triangle? Yes or No? Explain Why

a) 5cm, 7cm, 9cm  
a b c

$5 + 7 > 9$   
 $12 > 9$  **yes**

$a + b > c$

the two smaller sides when added, must be greater than largest side

c) 6 in, 9 in, 15 in

$6 + 9 > 15$   
 $15 > 15$  **NO**

b) 8ft, 3ft, 4ft  
c a b

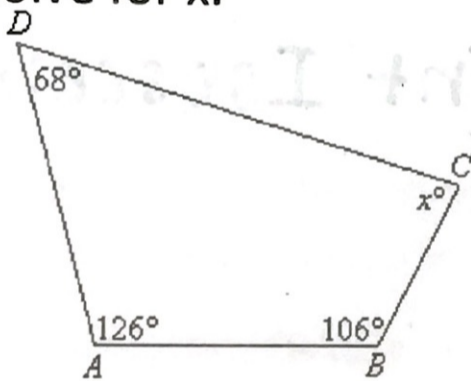
$3 + 4 > 8$   
 $7 > 8$  **NO**

d)  $50^\circ, 70^\circ, 70^\circ$

$70 + 70 + 50 = 180$   
 $190 = 180$   
**NO!**

$61 + 57 = 118$   
 $180 - 118 = 62$   
 $y = 62$

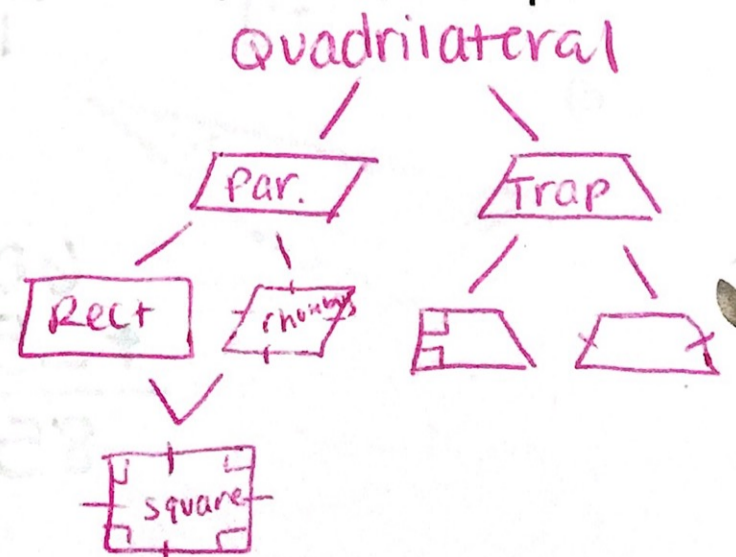
5. Solve for x.



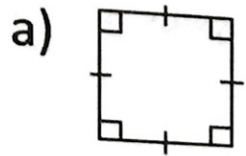
quadrilateral  
 sum of angles = 360  
 $68 + 126 + 106 = 300$   
 $360 - 300 = 60^\circ$

6. Answer True or False.

- a) T All parallelograms have two pairs of opposite sides parallel and equal
- b) T All rectangles have four right angles
- c) T All squares are rectangles
- d) F All parallelograms are squares
- e) F All trapezoids are parallelograms.
- f) F All trapezoids have right angles.



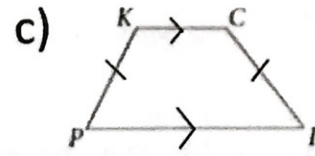
7. Classify the quadrilateral with the **best** name.  
 (quadrilateral, parallelogram, rectangle, rhombus, square, trapezoid, right trapezoid, isosceles trapezoid)



square  
 (also a parallelogram,  
 rectangle + rhombus)

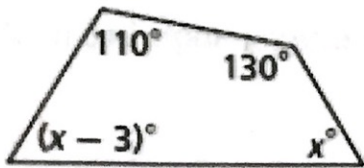


rhombus  
 (also a  
 parallelogram)



isosceles  
 trapezoid  
 (also a  
 trapezoid)

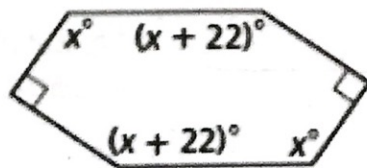
8. **Algebra** Find the value of  $x$  in each figure.



sum of angles: 360

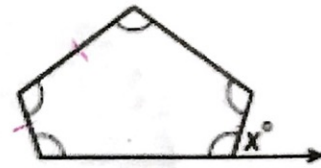
$$\begin{array}{r} 2x + 237 = 360 \\ - 237 \quad -237 \\ \hline \end{array}$$

-----  
 $2x = 123 \quad x = 61.5$



sum of  
 angles:  
 $180(n-2)$   
 $180(6-2)$   
 $180(4) = 720$

$$\begin{aligned} x + x + 22 + x + 22 + x + 90 + 90 &= 720 \\ 4x + 224 &= 720 \\ 4x &= 496 \quad \boxed{x = 124} \end{aligned}$$



$180(5-2)$   
 $180(3) = 540$   
 $540 / 5 = 108$   
 $180 - 108 = \boxed{72}$

9. **Multi-Step** An exterior angle measure of a regular polygon is given. Find the number of its sides and the measure of each interior angle.

a)  $120^\circ$

$$\frac{360^\circ}{120} = \boxed{3 \text{ sides}}$$

each interior =  $\boxed{60^\circ}$

b)  $36^\circ$

$$\frac{360}{36} = \boxed{10 \text{ sides}}$$

$180 - 36 = \boxed{144^\circ}$   
 each interior

10. a) Find the sum of the exterior angles of a pentagon.

$360^\circ$

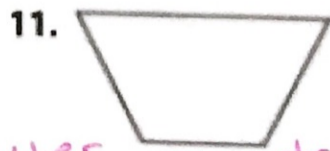
b) Find the sum of the exterior angles of a hexagon.

$360^\circ$

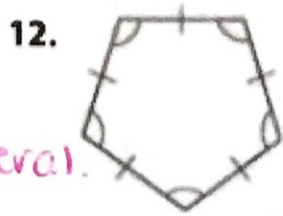
c) Find the measure of each exterior angle of a hexagon.

$$360 / 6 = \boxed{60^\circ}$$

Determine whether the figure is a polygon. If it is, classify the polygon and state whether it is regular. If it is not a polygon, explain why. 11–12. See margin.



yes, quadrilateral.  
not regular.



yes, pentagon.  
yes regular = sides + angles

Find the measure of an interior angle of each regular polygon.

13. hexagon  $120^\circ$

14. 18-gon  $160^\circ$

15. What is the measure of each interior angle of the stop sign?  $135^\circ$



$\frac{180(6-2)}{6}$

$\frac{180(8-2)}{8}$

### Example 3

Find the measure of one interior angle in a regular heptagon.

**Step 1** Find the sum of the measures of the angles. A heptagon has 7 sides. So,  $n = 7$ .

$(n - 2)180 = (7 - 2)180$  Replace  $n$  with 7.  
 $= 5(180)$  or  $900^\circ$  Simplify.

The sum of the measures of the interior angles is  $900^\circ$ .

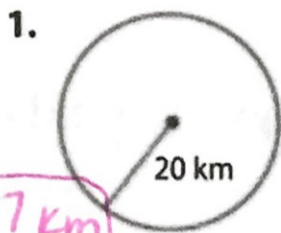
**Step 2** Divide the sum by 7 to find the measure of one angle.

$900 \div 7 \approx 128.6$

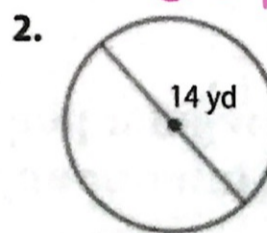
So, the measure of one interior angle in a heptagon is about  $128.6^\circ$ .

## Lesson 12-1 Circles and Circumference (pp. 558–562)

Find the circumference of each circle. Round to the nearest tenth.



$C = \pi d$   
 $40\pi$   
 $= 125.7 \text{ km}$



$C = \pi d$   
 $14\pi$   
 $= 44.0 \text{ yd}$

3. diameter =  $5\frac{1}{3}$  ft

4. radius = 13.5 mm

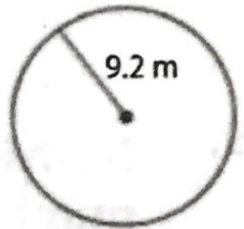
5. A Ferris wheel has a diameter of 250 feet. What is the distance, to the nearest whole foot, that riders travel if they stay on it for 15 rotations?

$C = \pi(5\frac{1}{3})$   
 $= 16.8 \text{ ft}$

$C = \pi(250) = 785.3975(15)$   
 $= 11,781 \text{ ft}$

### Example 1

Find the circumference of the circle. Round to the nearest tenth.



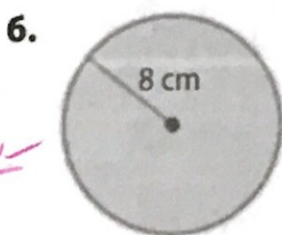
$C = 2\pi r$  Circumference of a circle  
 $= 2 \cdot \pi \cdot 9.2$  Replace  $r$  with 9.2.  
 $\approx 57.8$  Simplify.

So, the circumference of the circle is about 57.8 meters.

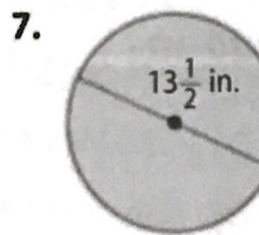
$C = \pi(27)$   
 $= 84.8 \text{ mm}$

## Lesson 12-2 Area of Circles (pp. 563–567)

Find the area of each circle. Round to the nearest tenth.



$A = \pi r^2$   
 $\pi(8)^2$   
 $64\pi$   
 $= 201.1 \text{ cm}^2$



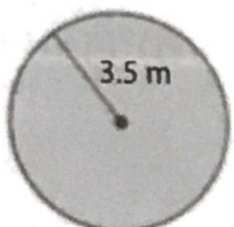
$\pi(6.75)^2$   
 $= 143.1 \text{ in}^2$

8. A pie has a diameter of 9 inches. Find the area of the top crust. Round to the nearest tenth.

$9/2 = 4.5$   
 $A = \pi(4.5)^2 = 63.6 \text{ in}^2$

### Example 2

Find the area of the circle. Round to the nearest tenth.



$A = \pi r^2$  Area of a circle  
 $= \pi \cdot 3.5^2$  Replace  $r$  with 3.5.  
 $\approx 38.5$  Simplify.

So, the area of the circle is about 38.5 square meters.

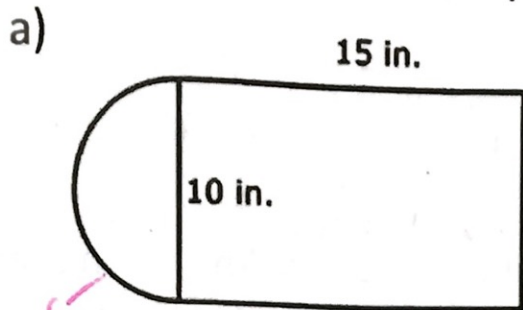
# Area of Polygons

Parallelogram:  $(b)(h)$

Triangle:  $\frac{1}{2}(b)(h)$

Trapezoid:  $\frac{1}{2}(b_1+b_2)h$

1. Find the area of the composite figures to the nearest tenth. Show all work.



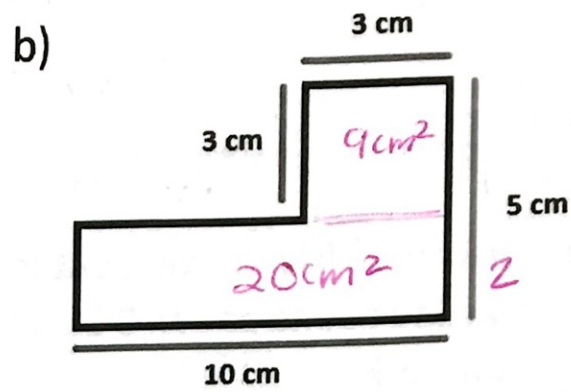
$$A = \frac{\pi r^2}{2}$$

$$\frac{\pi (5)^2}{2} = 39.3 \text{ in}^2$$

$$A = lw$$

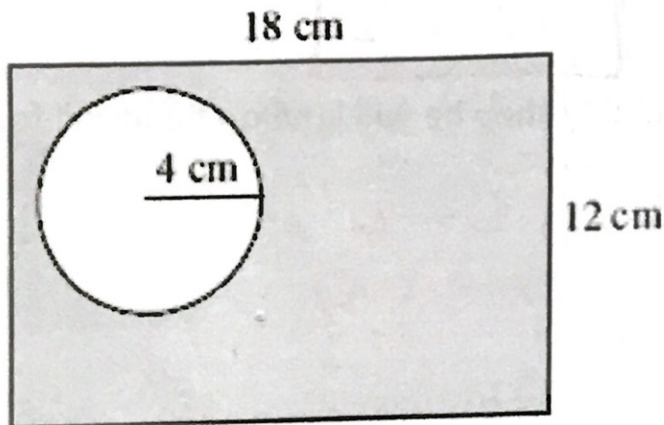
$$10 \cdot 15 = 150 \text{ in}^2$$

$$39.3 + 150 = 189.3 \text{ in}^2$$



$$20 + 9 = 29 \text{ cm}^2$$

2. Find the area of the shaded region to the nearest hundredth.



$$A = 18(12) = 216 \text{ cm}^2$$

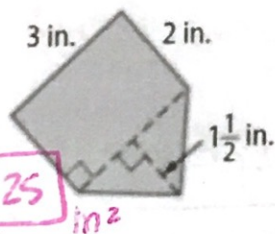
$$\text{circle} = \pi r^2$$

$$\pi (4)^2$$

$$16\pi \approx 50.2654$$

$$216 - 16\pi = 165.73 \text{ cm}^2$$

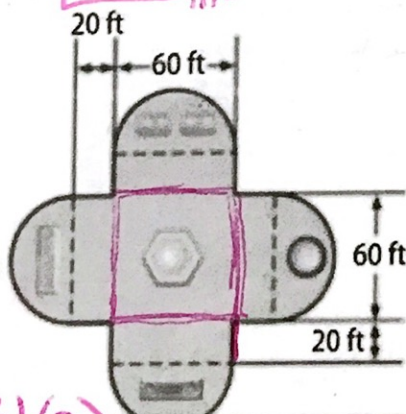
9. Find the area of the composite figure.



$$3(2) = 6 \text{ in}^2 +$$

$$\frac{1}{2}(3)(1.5) = 2.25 \text{ in}^2 = 8.25 \text{ in}^2$$

10. The floor plan of a new museum is shown. What is the area of the museum rounded to the nearest square foot?



2 circles:

$$\pi r^2 = \pi (30)^2$$

$$= 2827.431(2)$$

$$5654.862$$

4 rectangles:

$$20(60) = 1200(4) = 4800$$

1 square

$$60(60)$$

$$3600$$

ANSWER

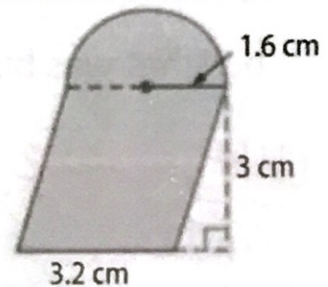
$$5654.862 + 4800 + 3600 = 14055$$

$$= ft^2$$

## Example 3

Find the area of the composite figure.

Find the areas of the semicircle and the parallelogram. Then add.



Area of Semicircle

$$A = \frac{1}{2}\pi r^2$$

$$= \frac{1}{2}\pi (1.6)^2$$

$$\approx 4.0 \text{ cm}^2$$

Area of Parallelogram

$$A = bh$$

$$= (3.2)(3)$$

$$\approx 9.6 \text{ cm}^2$$

The area is  $4.0 + 9.6$  or about 13.6 square centimeters.

## Throwback!

1. The price of a math book is \$50, but you have only \$35 with you. If you get a discount of 20%, how much money do you need to borrow from a friend so that you can buy the book?

$$50(.20) = \$10 \leftarrow \text{discount}$$

$$\$50 - 10 = \$40 \rightarrow \text{new cost of book}$$

$$40 - 35 = \$5$$

$\$5 \text{ must be borrowed}$

2. Maria and her three friends went out to eat. The bill total was \$114.25. They then used a 15% off coupon and had to pay an 8.25% tax on the bill. What was the total bill and how much did each person pay?

$$\$114.25(.15) = \$17.14 \rightarrow \text{discount}$$

$$114.25 - 17.14 = \$97.11$$

$$\$97.11(.0825) = \$8.01 \rightarrow \text{tax}$$

$\$105.12$

Each person will pay \$26.28

3. Danny tosses a coin four times. What is the probability they he will land on heads all four times?

$$\frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2} = \frac{1}{16} = \boxed{6.25\% \text{ chance}}$$

4. Paul challenged his friends to a race. He told them he could run a mile in 7 min and 30 seconds but actually ran the mile in 8 minutes and 10 seconds.

a. Convert the times to <sup>seconds</sup> minutes  $450 \text{ sec}$  and  $490 \text{ sec}$ .

b. What was his percent error?

$$\% \text{ error} = \frac{\text{difference}}{\text{actual}} \times 100$$

$$\frac{490 - 450}{490} = \frac{40}{490} = \boxed{8.16\% \text{ error}}$$

5. Solve for x:  $5x + 3(x+4) = 16x - 4$

distribute first!

$$5x + 3x + 12 = 16x - 4$$

$$8x + 12 = 16x - 4$$

$$\begin{array}{r} -8x \phantom{+12} \\ \hline 12 = 8x - 4 \end{array}$$

$$\begin{array}{r} 12 = 8x - 4 \\ +4 \phantom{=} \\ \hline 16 = 8x \end{array}$$

$$\frac{16}{8} = \frac{8x}{8}$$

$x = 2$

check:

$$5(2) + 3(2+4) = 16(2) - 4$$

$$10 + 3(6) = 32 - 4$$

$$10 + 18$$

$$28 = 28 \checkmark$$