Name: _____ Class: _____

Write your questions here!

2.1 A Rectangles & Squares Notes

PART 1: Middle School Review

********Fill in all highlighted areas******

Rectangle	**Square** (Special Type of Rectangle)
 Definition of a Rectangle A rectangle is a 4-sides enclosed geometric shape with: • _____ right angles • Opposite _____ are congruent	 Definition of a Square A square is still a rectangle because it is a 4-sided enclosed geometric shape with: • _____ right angles • Opposite _____ are congruent • All of it's sides are the _____ length

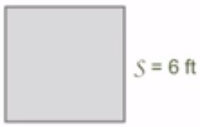
Perimeter is the measurement of the path that surrounds a 2D shape… or more simply put the _____ a shape.

Perimeter of Rectangles

Rectangle

Formula

Square

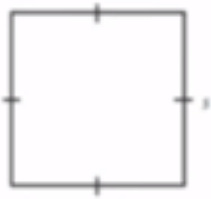


Formula

Perimeter Working Backwards

Examples:

(a)



$P = 20$ cm

$s =$ _____

(b)

$P = 32$ in

$w =$ _____

$l =$ _____

Write your questions here!

Area

- The size of a surface
- The amount of _____ inside the boundary of a flat (2D) object such as a triangle or circle.

Draw inside the images below as seen in the video.

Area (Square Units)

Rectangle

Formula

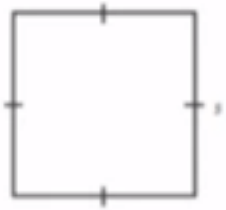
Square

Formula

Area Working Backwards

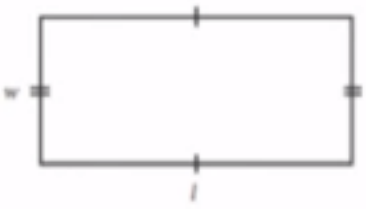
Examples:

(a)



$A = 36\ ft^2$
$s = ?$

(b)



$A = 81\ in^2$
$l = 27$
$w = ?$

Write your questions here!

PART 2: Unit Conversion (Middle School Review)

English Conversions you must know

- 1 foot = _____ inches
- 1 yard = _____ feet
- 1 mile = _____ feet
- 1 hour = _____ minutes
- 1 minute = _____ seconds

Metric Units you must know

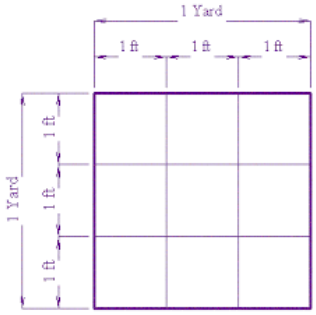
- 1 cm = _____ mm
- 1 m = _____ cm
- 1 km = _____ m

Converting between English to Metric

- 1 inch = _____ cm
- 1 mile = 1.60934 km

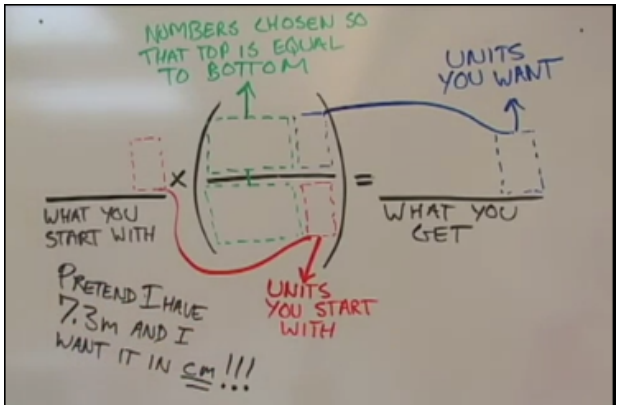
Converting in square units – **Simply square the ratio**

- 1 yd^2 = _____ ft^2
- 1 ft^2 = _____ in^2



Examples

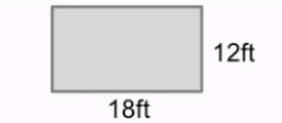
Length: Convert 7.3 m into cm.



Speed: Chris Johnson runs 40 yards in 4.24 seconds. If he continues at this speed, what would his rate be in miles per hour?

$$\text{speed} = \frac{\text{distance}}{\text{time}}$$

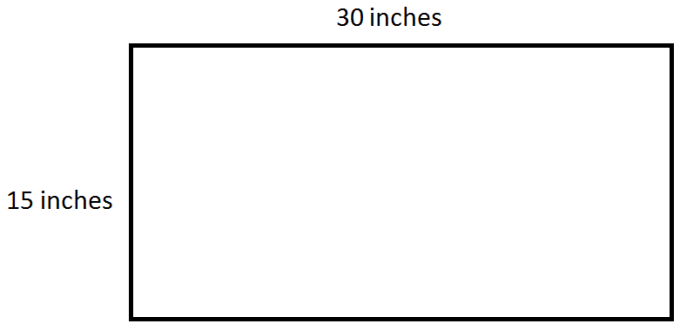
Perimeter: Find the perimeter of the rectangle below in inches and in yards.



Perimeter in inches =

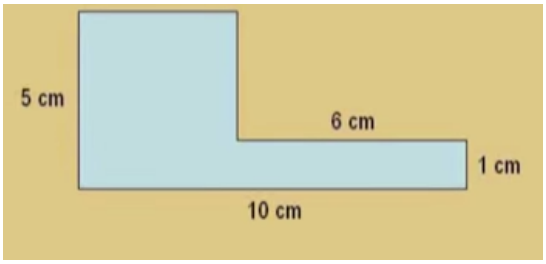
Perimeter in yards =

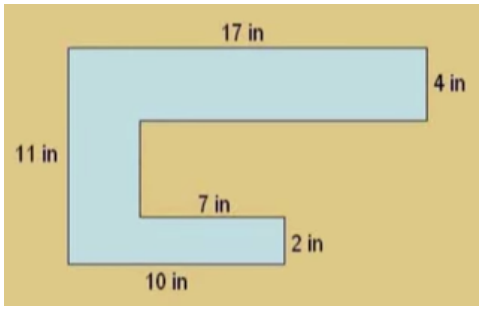
Area: Find the area of the rectangles below in feet squared.



PART 3: Composite Shapes (Geometry Extension)

Find the perimeter and area of the irregular shapes below:





P =

P =

A =

A =

Now, summarize your notes here!

Summarize your notes:

PRACTICE PROBLEMS

Answer the following questions below. *Make sure to include units.*

1. Find the perimeter of a rectangle with a length of 25 feet and a width of 7 feet.

   Picture:

   Perimeter:

2. Find the area of rectangle that has a length of 12.4 cm and a width of 4.3 cm.

   Picture:

   Area:

3. Find the area and perimeter of a square with a side length of 6 yards.

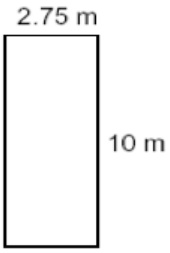
   Picture:

   Area: Perimeter:

4. Find the area and perimeter of the rectangle.

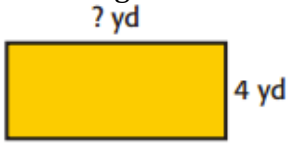
   Area: _____

   Perimeter: _____



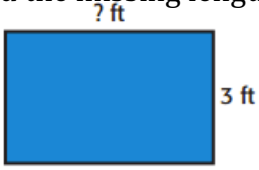
Missing Lengths

5. Find the length of the rectangle.



Area = 28 sq yd

6. Find the missing length of the rectangle.



Perimeter = 24 ft

Area and Perimeter Problems

6. The perimeter of a rectangle is 92 yards. The rectangles width is 14 yards, what is area of the rectangle?

7. What is the area of a square, with a perimeter of 100 inches?

8. A rectangular rug has an area of 28 square feet and a length of 7 feet. What is the perimeter of the rug?

9. A rectangle has an area of 56 square feet, and a width of 4 feet. What is the perimeter, in feet of the rectangle?

10. The perimeter of a rectangle is 30 feet. What the area of the rectangle, if one side is of the rectangle 8ft long?

11. The length of a rectangle is 3 times its width. The perimeter of the rectangle is 32 feet. What are the rectangle's length and width?

12. Kayla took 25 minutes to walk around a rectangular city block. If the block's width is $\frac{1}{4}$ the size of the length, how long would it take to walk along one length?

Dimensional analysis, which is sometimes referred to as label method or a unit-factor method, is a method to convert one different type of unit to another.

Ex 1: Two days is equivalent to how many seconds?

$$\frac{2\ \cancel{days}}{}\cdot\frac{24\ \cancel{hr}}{1\ \cancel{day}}\cdot\frac{60\ \cancel{min}}{1\ \cancel{hr}}\cdot\frac{60\,\text{sec}}{1\ \cancel{min}}$$

$$=2\cdot24\cdot60\cdot60=172{,}800\,\text{sec}$$

Ex 2: 5 square feet is equivalent to how many square inches?

$$\frac{0.5\ ft^2}{}\cdot\left(\frac{12\ in}{1\,ft}\right)^2$$

$$\frac{0.5\ \cancel{ft}^2}{}\cdot\frac{144\ in^2}{1\ \cancel{ft}^2}=72\ in^2$$

Ex 3: A quarter of a mile per hour is equivalent to how many feet per second?

$$\frac{0.25\ \cancel{mile}}{1\ \cancel{hr}}\cdot\frac{1\ \cancel{hr}}{60\ \cancel{min}}\cdot\frac{1\ \cancel{min}}{60\,\text{sec}}\cdot\frac{5280\ ft}{1\ \cancel{mile}}$$

$$=\frac{(0.25)\cdot5280\ ft}{60\cdot60\,\text{sec}}=\frac{1320\,\text{ft}}{3600\,\text{sec}}=\frac{11\,\text{ft}}{30\,\text{sec}}\ or\ 0.3\overline{6}\,\text{sec}$$

Find equivalent units using dimensional analysis.

11. 4 yards is equal to how many feet?

$4\ yd$ ____ . ____

12. 6.3 cm is equal to how many millimeters?

$6.3\ cm$ ____ . ____

13. How many minutes are in 2.5 hours?

$2.5\ hr$ ____ . ____

14. Mrs. Urquhart went to Puerto Rico for her Honeymoon and saw the following speed limit sign. (1 km = 1000m)

In Puerto Rico people measure speed in kilometer per hour, whereas in the US we use mile per hour. What would the speed limit be of the sign below in miles per hour.

15. Convert 3 kilometers into feet by filling in the blanks below and solving.

$$\frac{3\ km}{}\cdot\frac{\quad mi}{km}\cdot\frac{\quad ft}{mi}$$

16. Convert 2.3 miles into centimeters by filling in the blanks below and solving.

$$\frac{2.3\ miles}{}\cdot\frac{\quad ft}{miles}\cdot\frac{\quad in}{ft}\cdot\frac{\quad cm}{in}$$

17. 8ft = ? cm

(Hint: 1 in = 2.54 cm)

$8\ ft$ ____ . ____ . ____

18. 84 inches is equal to how many yards?

$84\ in$ ____ . ____ . ____

19. 0.237 meters is equal to how millimeters?

$0.237\ m$ ____ . ____ . ____

Jack-N-the-Box - 3 act math

Find equivalent units using dimensional analysis for square units.

20. One square yard is equal to how many feet squared?

$1\ yd^2 \cdot \_\_\_\_$

21. 2 square feet is equal to how many square inches?

$2\ ft^2 \cdot \_\_\_\_$

22. 0.5 square centimeters is equal to how many square millimeters?

$0.5\ cm^2 \cdot \_\_\_\_$

23. $150\ mm^2 = ?\ cm^2$

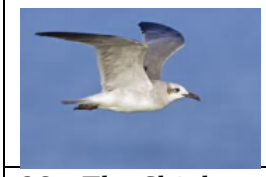
$1\ mm^2 \cdot \_\_\_\_$

24. 2700 square inches is equal to how many square yards?

$2700\ in^2 \cdot \_\_\_\_ \cdot \_\_\_\_$

25. $4.3\ yd^2 = ?\ in^2$

$4.3\ yd^2 \cdot \_\_\_\_ \cdot \_\_\_\_$

Find equivalent unit rates using dimensional analysis.	
26. A seagull can fly at a speed of 22 miles per hour. About how many feet per second can the seagull fly? 	27. The average teenager spends $1742 per year on fashion related items. How much is this per week? 
28. The Shinkansen passenger train of Japan travels at a rate of 300 kilometers per hour. How many meters per hour is this speed? 	29. A car is traveling 89.5 miles per hour. How fast is that in meters per second?
30. What is 8,800 fps (feet per second) in mph (miles per hour)?	

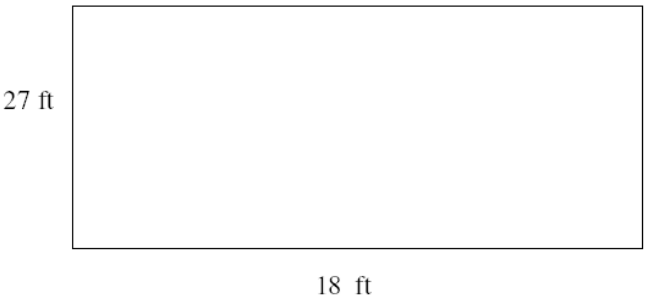
14. A group of high school students is planning to paint one side of the solid concrete wall around the elementary school playground as a way to give back to the community. The wall is 120 feet long and 8 feet tall. Assuming that 1 can of paint covers exactly 25 square feet, what is the minimum number of cans of paint the students will need in order to put 1 coat of paint on the wall?

A. 38
B. 39
C. 42
D. 47
E. 56

15. Edging cost $2.32 per 12-inch stone and you want a double layer of edging around your flowerbed that is 6 yards by 1 yard. How much will edging your flowerbed cost?

A. $32.48
B. $64.96
C. $97.44
D. $129.92
E. $194.88

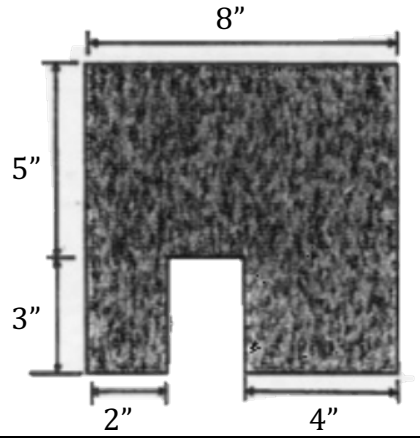
16. Mrs. Astilla's living room is shaped like a rectangle, as shown below. What is the cost of carpeting her living room if the carpet cost $80 per square yard?



Find the area a perimeter of each irregular shape below.

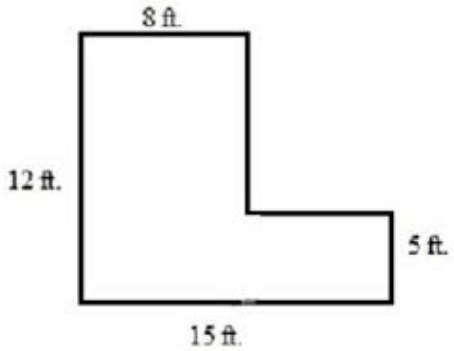
1. Who has the right approach in finding area in the figure below. Explain. Then find the area using the correct method and include units.

Susanna says "You just add up the area of 3 rectangles."



Darryl says "You just do a rectangle minus another rectangle."

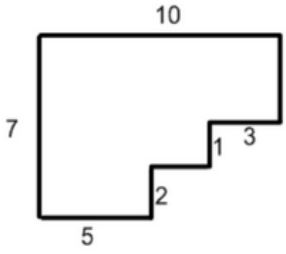
2.



Perimeter =

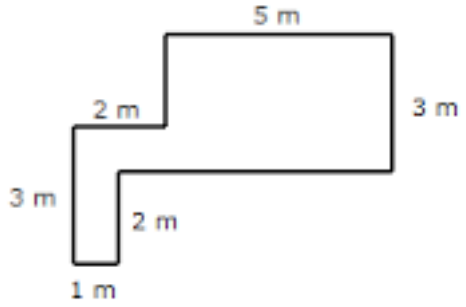
Area =

3. (In yards)



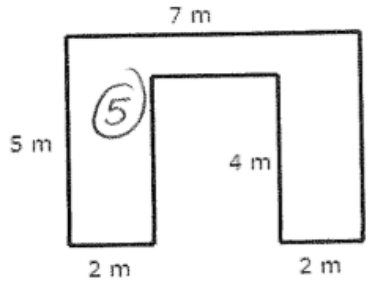
Perimeter =

Area =

4. 

Perimeter =

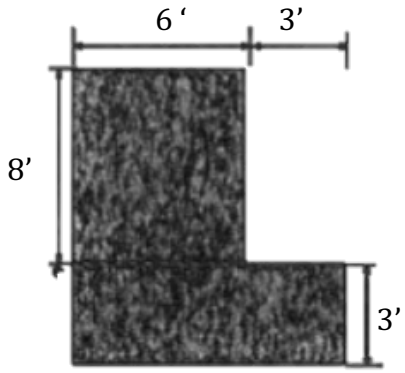
Area =

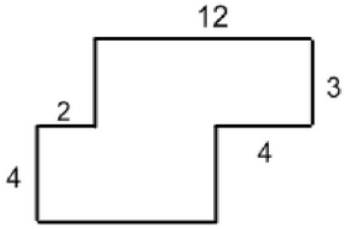
5. 

Perimeter =

Area =

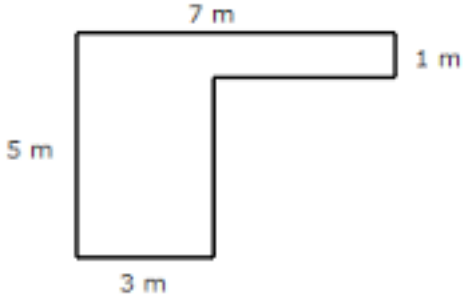
6. Find the area and perimeter of the figure below. Provide units



7. 

Perimeter =

Area =

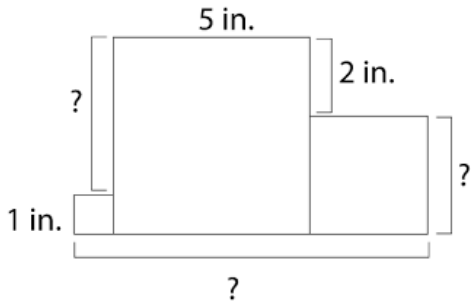
8. 

Find the perimeter in yards and the area in yards^2.

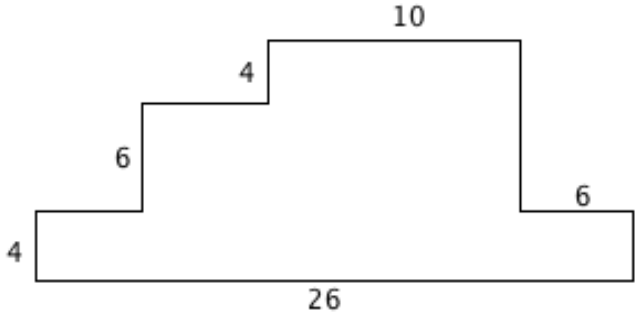
Perimeter =

Area =

9. Find the missing sides below. All three images below are squares.



10. Find the perimeter of the irregular shape below.



Perimeter =

Brick by Brick – 3 Act Math Activity