Composite Shapes

Don’t let this be you!

Things to remember:

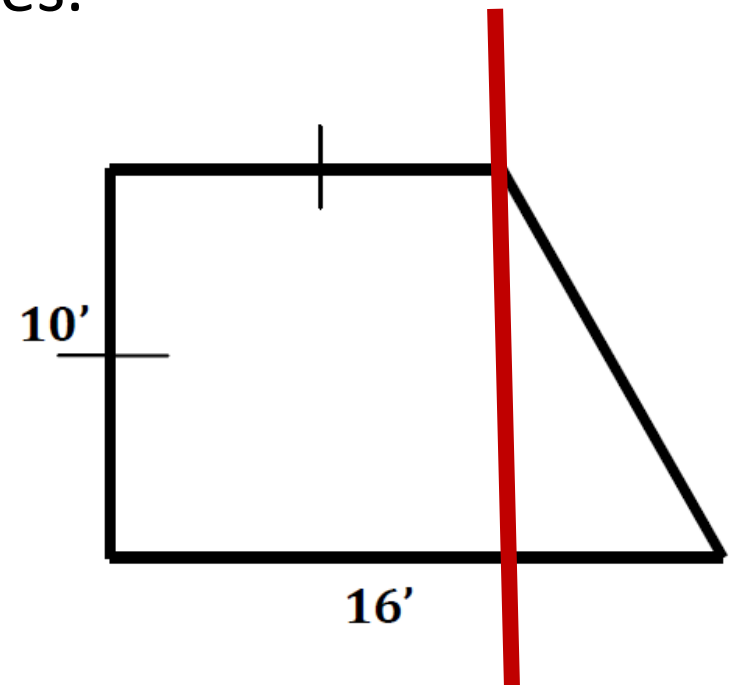
Some are more obvious than others

1. Your goal is to find the area of the shape in question.
2. This is done by breaking down the figure into simple shapes.
3. For now, the only shapes you need to worry about are rectangles, triangles, and circles.
4. Some measurements won't be "spoon-fed" to you. You'll need to "hunt for your food" and use the other measurements in the determine the measurement you need.

Example 1 – Composite with missing measurements

Step 1 – Divide the figure into simple shapes

By looking at the figure we can see a square (length and width are the same) and a triangle. Let's go ahead and make a line to divide the two shapes.



Example 1 – Composite with missing measurements

Step 2 – Find the measurements you need to determine area.

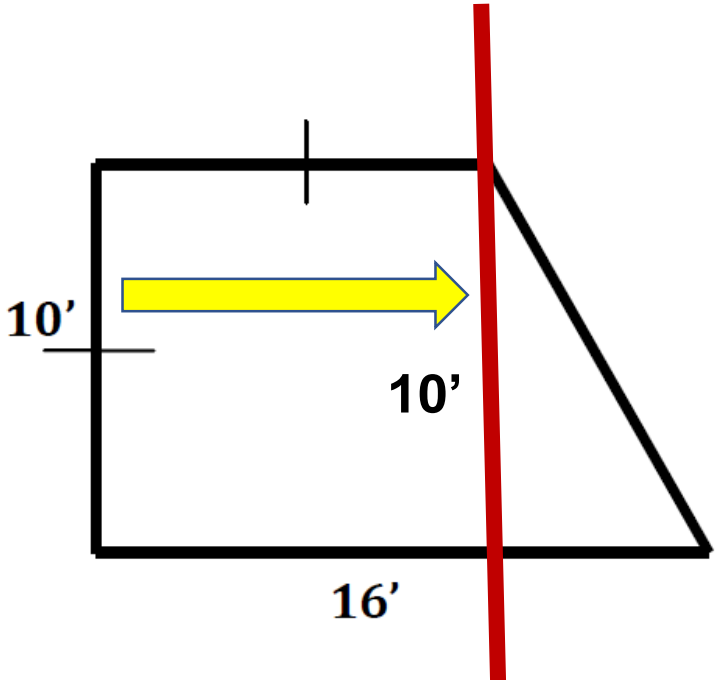
The 10’ x 10’ square doesn’t need to be figured out. The triangle is missing the measurement for the height and the base.

Determine height:

The 10’ at the far left is parallel to

The height of the triangle. So 10’

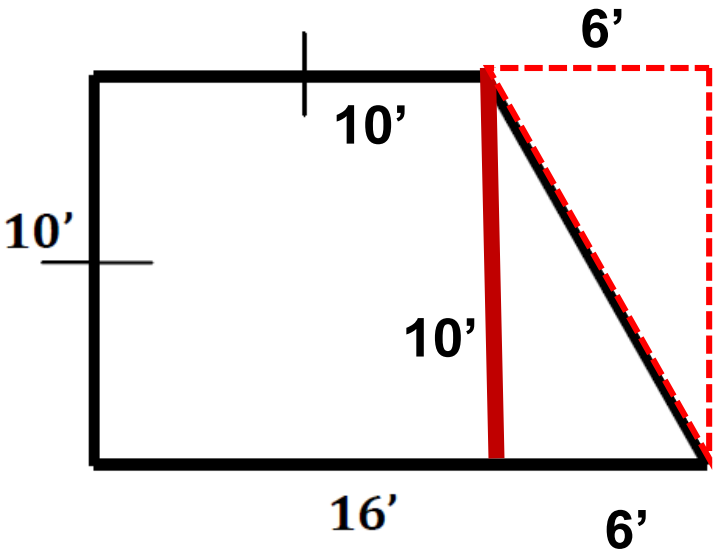
Works.



Example 1 – Composite with missing measurements

Step 2 – Find the measurements you need to determine area.

Determine base: The base is the bottom of the triangle. The measurement at the bottom of the square and triangle is 16’ and the top of the square is 10’. So how many feet are left if we take away 10 from 16?



Fun Fact: If you’re ever cold in a room just go stand in the corner with a right angle for a little while. Why? Because it’s 90 degrees.

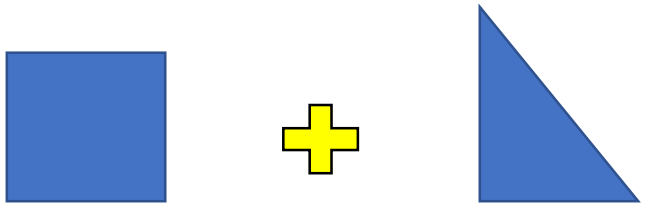
Example 1 – Composite with missing measurements

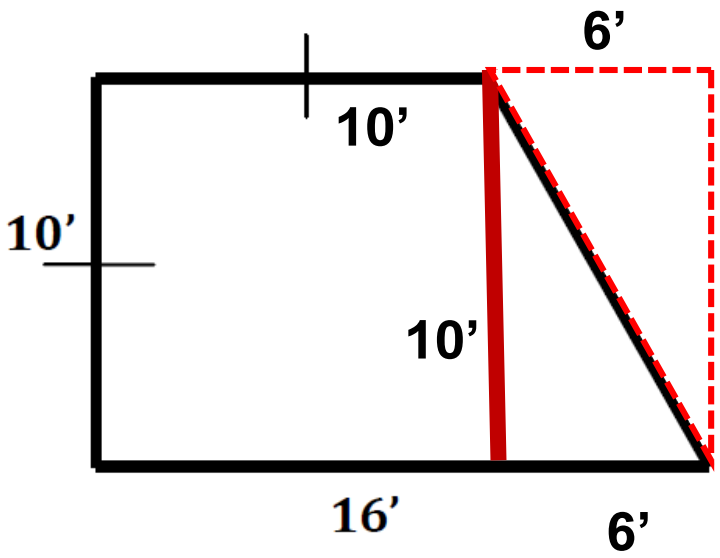
Step 3 – Set up your formula.

Formula for square = length x width

Formula for triangle = $\frac{1}{2}$ x base x height

If you're a visual person it doesn't hurt to draw the shapes you're working with



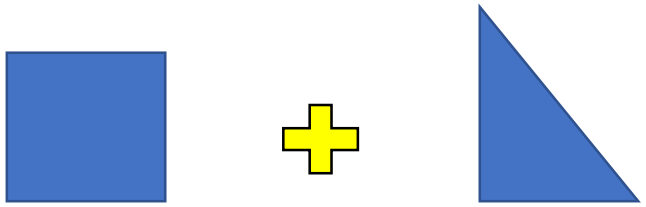


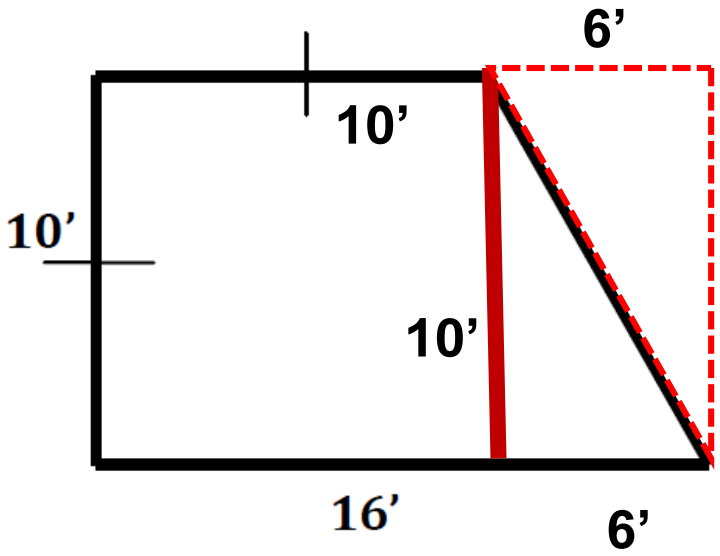
Example 1 – Composite with missing measurements

Step 3 – Set up your formula.

$$\mathbf{(l \times w) + (\frac{1}{2} bh)}$$

$$(10 \times 10) + (\frac{1}{2} \times 6 \times 10)$$





Example 1 – Composite with missing measurements

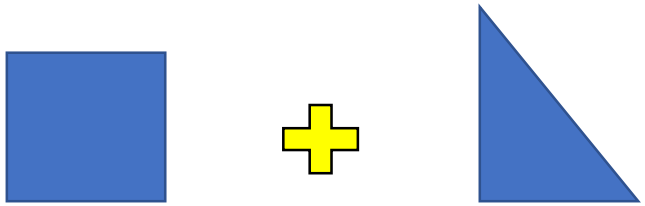
Step 4 – Use your big brain and find the area

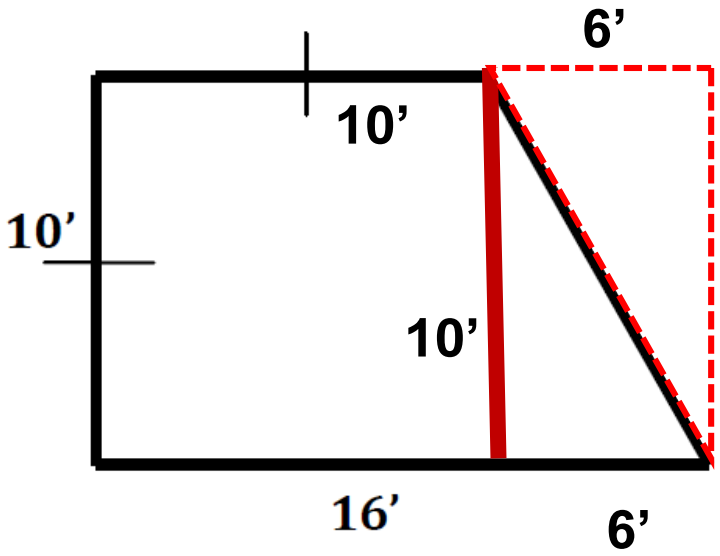
$$(l \times w) + (\frac{1}{2} bh)$$

$$(10 \times 10) + (\frac{1}{2} \times 6 \times 10)$$

$$100 + 30$$

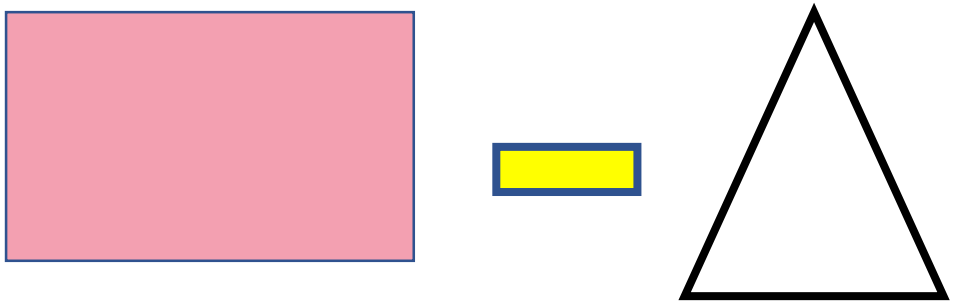
$130'^2$

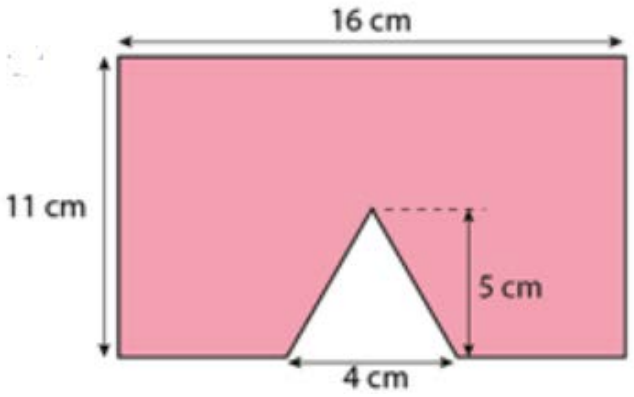




Example 2 – Shape in a Shape

- Sometimes the area you need to find will have spaces missing or cut out. Think about the donut hole.
- To find this area you won't add the shapes but subtract the non-shaded area from the shaded area (you'll normally be looking for the area of the "shaded" area)





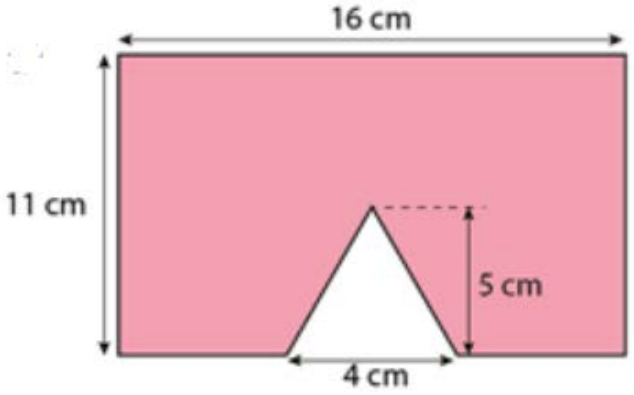
Example 2 – Shape in a Shape

Follow the steps (sometimes you can skip if it's already done for you)

Step 1 – Divide the figure into simple shapes.

Step 2 – Find the measurements you need to determine area.

The first two steps are already done so we can skip ahead to setting up the formula.



Example 2 – Shape in a Shape

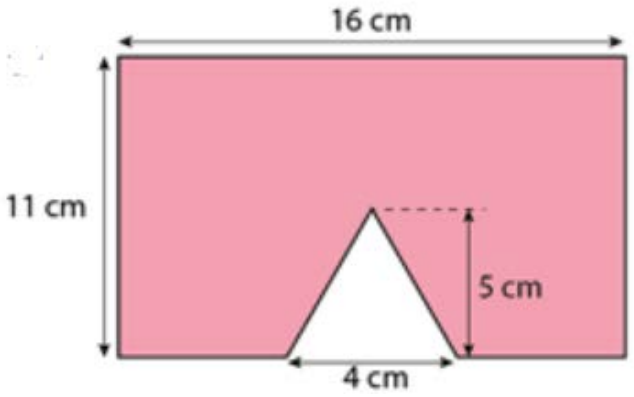
Step 3 – Set up your formula.

Area of rectangle = length x width

Area of triangle = $\frac{1}{2}$ x base x height

(11 x 16) – ($\frac{1}{2}$ x 4 x 5)

Remember to **SUBTRACT**



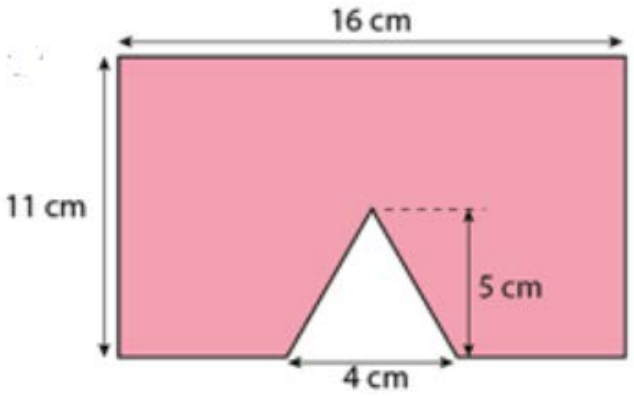
Example 2 – Shape in a Shape

Step 4 – Find the Area

$$(11 \times 16) - (\frac{1}{2} \times 4 \times 5)$$

$$176 \quad - \quad 10$$

166 cm²

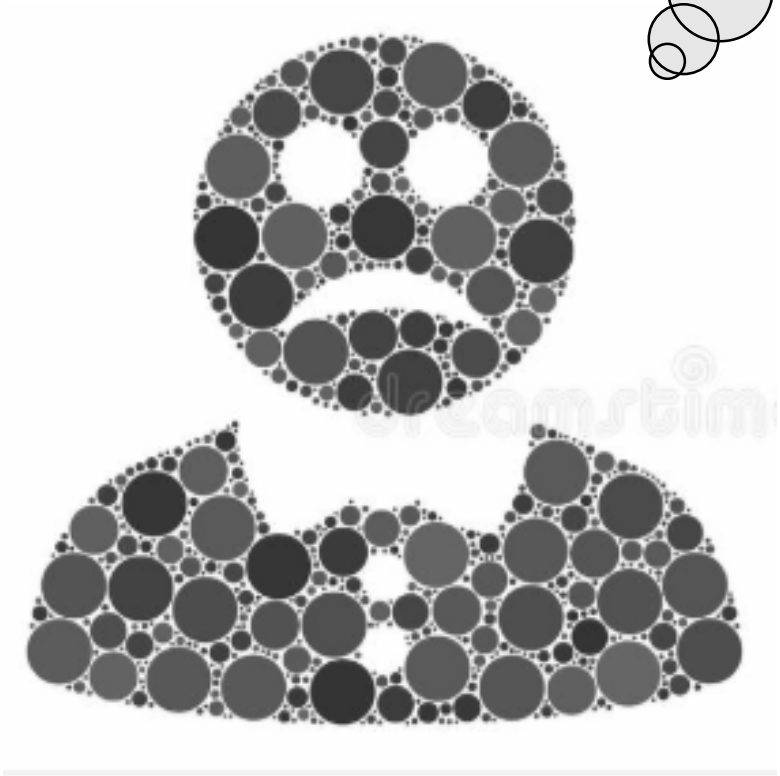


Hopefully this seems easy….

- One of the hardest things with composite shapes is finding the missing measurements.

- Another difficult thing with composites is…..

HELP ME!

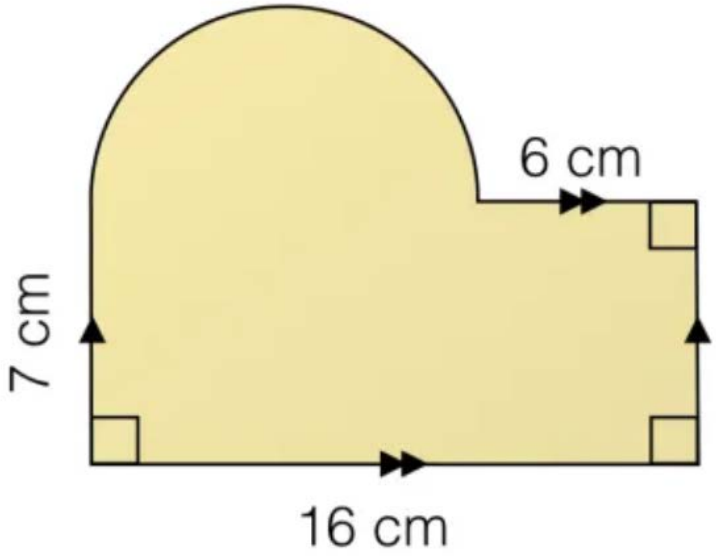


Circles!!!!!

Example 3 – Stinky Circles

- Circles can look intimidating but if you break it into simple figures and you write down your work so numbers don't get lost in your mind palace it can be way simpler.

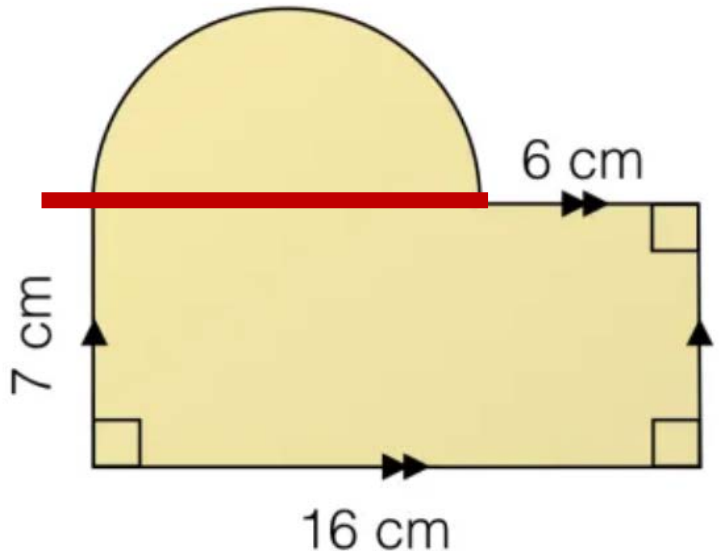
Ignore the little black triangles on the figure. They aren't relevant.



Example 3 – Stinky Circles

Step 1 – Divide the figure into simple shapes.

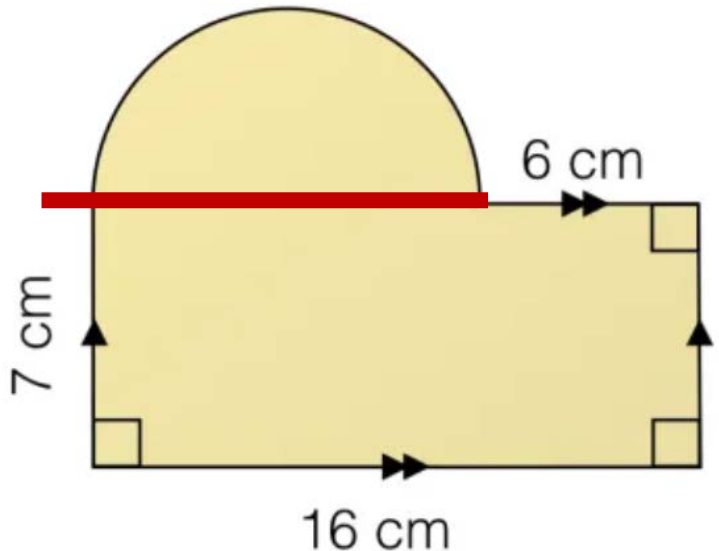
We see a rectangle at the bottom and a half-circle on top. So let's go ahead and split them up.



Example 3 – Stinky Circles

Step 2 – Find the measurements you need to determine area.

The length and width of the rectangle are listed so we already have them with 7cm and 16cm.

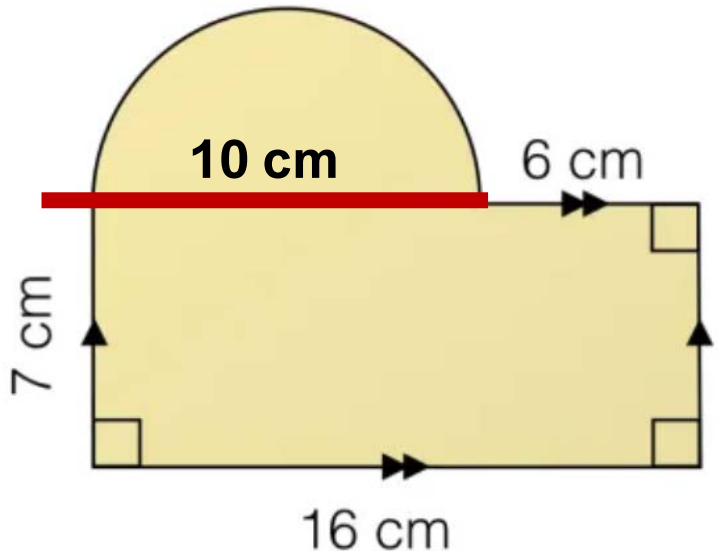


Example 3 – Stinky Circles

Step 2 – Find the measurements you need to determine area.

The circle is the tricky one here. To find the area of a circle we need to find the radius first.

The bottom length is 16 cm. If you have 6 cm measured on the right side we can subtract that from 16 to get 10cm.

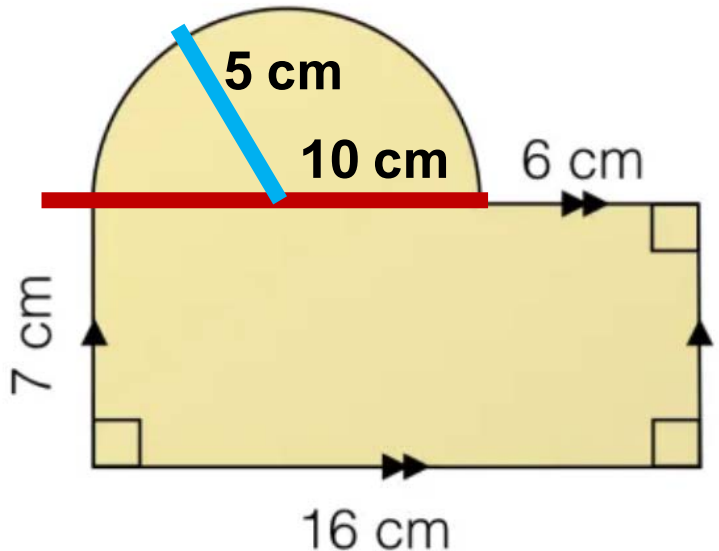


Example 3 – Stinky Circles

Step 2 – Find the measurements you need to determine area.

When finding measurements for a circle the 10 cm we see on the figure is the circle's diameter. To find the radius you divide the diameter by 2.

The radius is 5 cm.



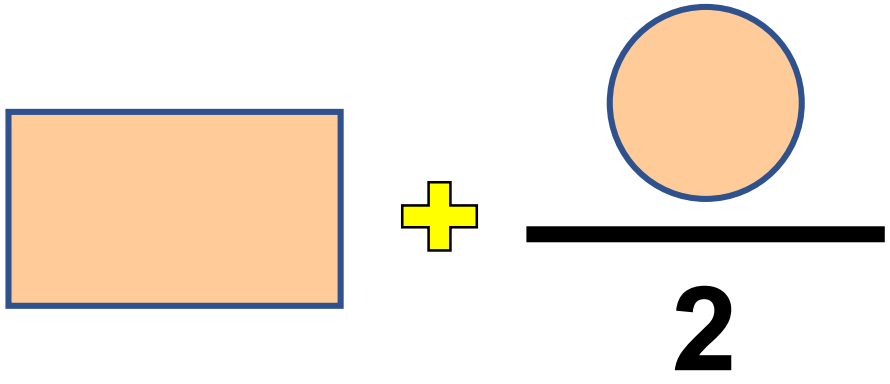
Example 3 – Stinky Circles

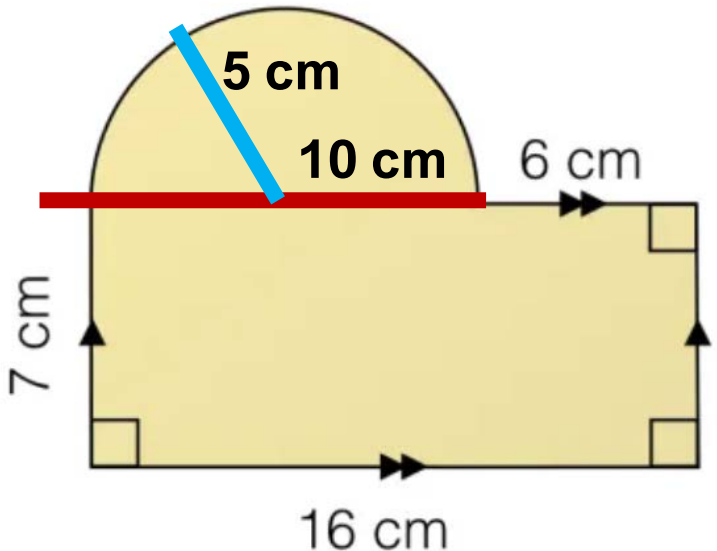
Step 3 – Set up your formula

$$(\text{length} \times \text{width}) + (\Pi \times \text{radius}^2)/2$$

Reminder: It's divided by 2 because it's half a circle.

If there is ever a time to draw figures as a reminder of what you're doing – do it with **half circles!**



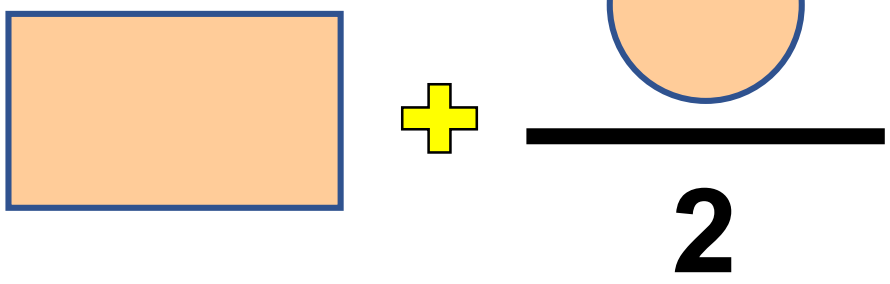


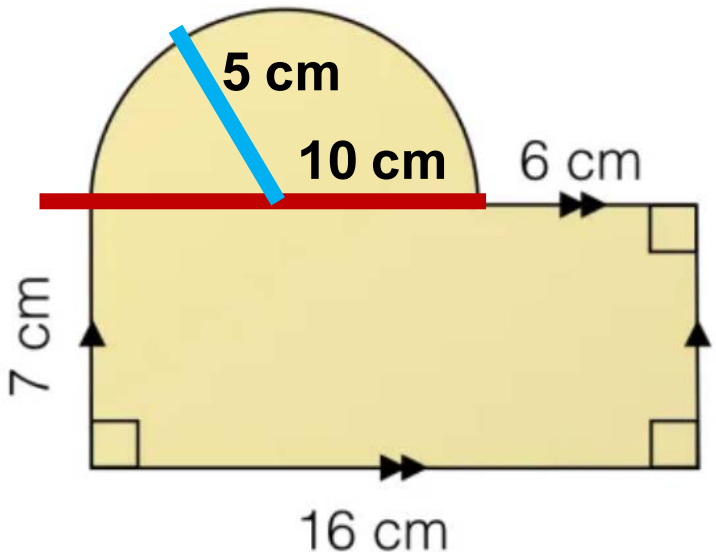
Example 3 – Stinky Circles

Step 3 – Set up your formula

(length x width) + (Π x radius^2)/2

(7 x 16) + (3.14 x 5^2)/2





Example 3 – Stinky Circles

Remember order of operations

Step 3 – Find the Area

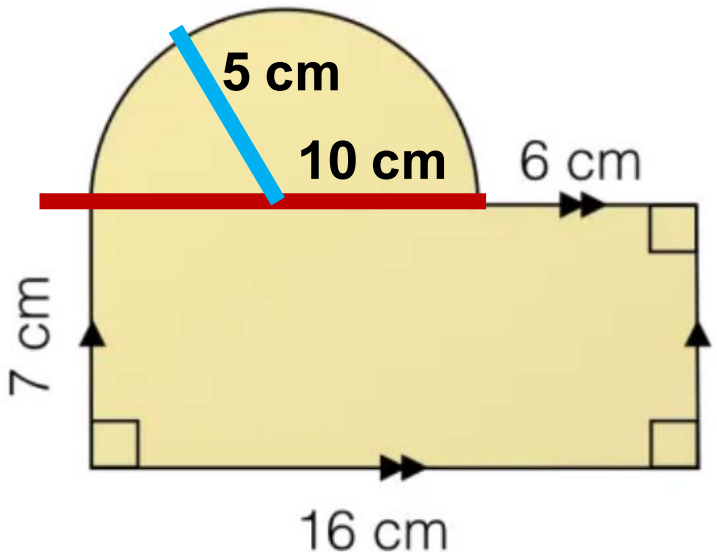
$$(7 \times 16) + (3.14 \times 5^2)/2$$

$$(7 \times 16) + (3.14 \times 25)/2$$

$$112 + 78.5/2$$

$$112 + 39.25$$

$$151.25 \text{ cm}^2$$

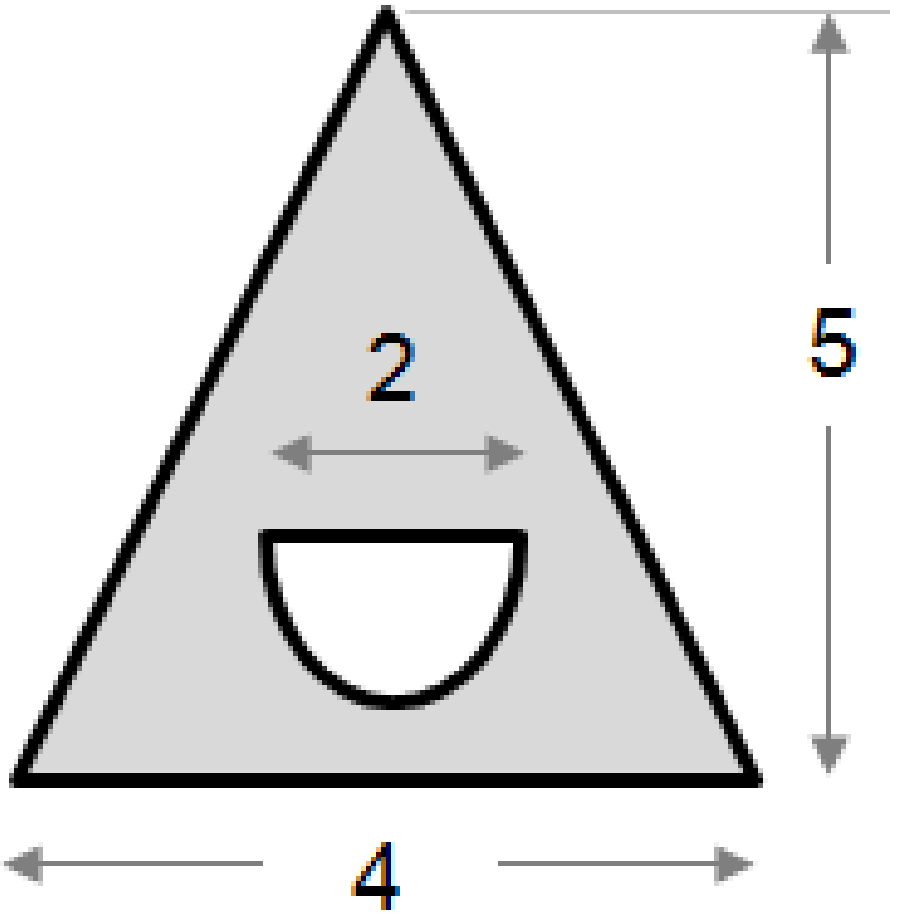


You may like it if you find the area of the rectangle and circle separately then add them together. Go for it!

Practice

- See how you do with these composite shapes with these 5 shapes. An answer key (and how to get the answers) is at the end here for you to check your work.
- #5 may make you say “jeepers” but you won’t see this on the test. It would take way too long and the test would last forever. Nobody wants that.

1



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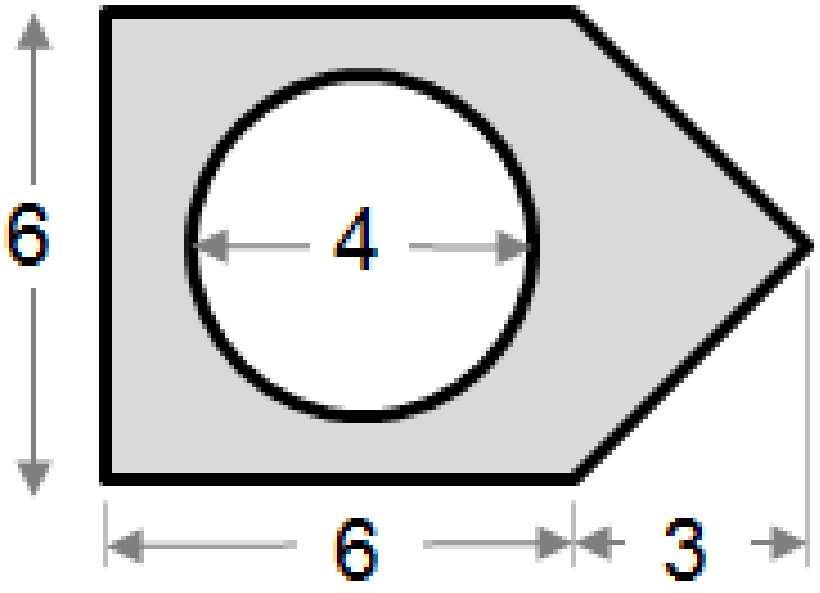
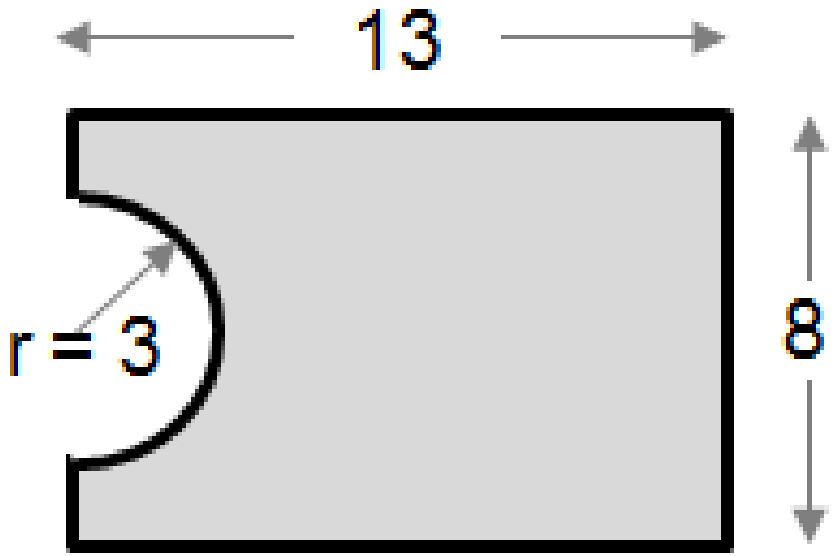
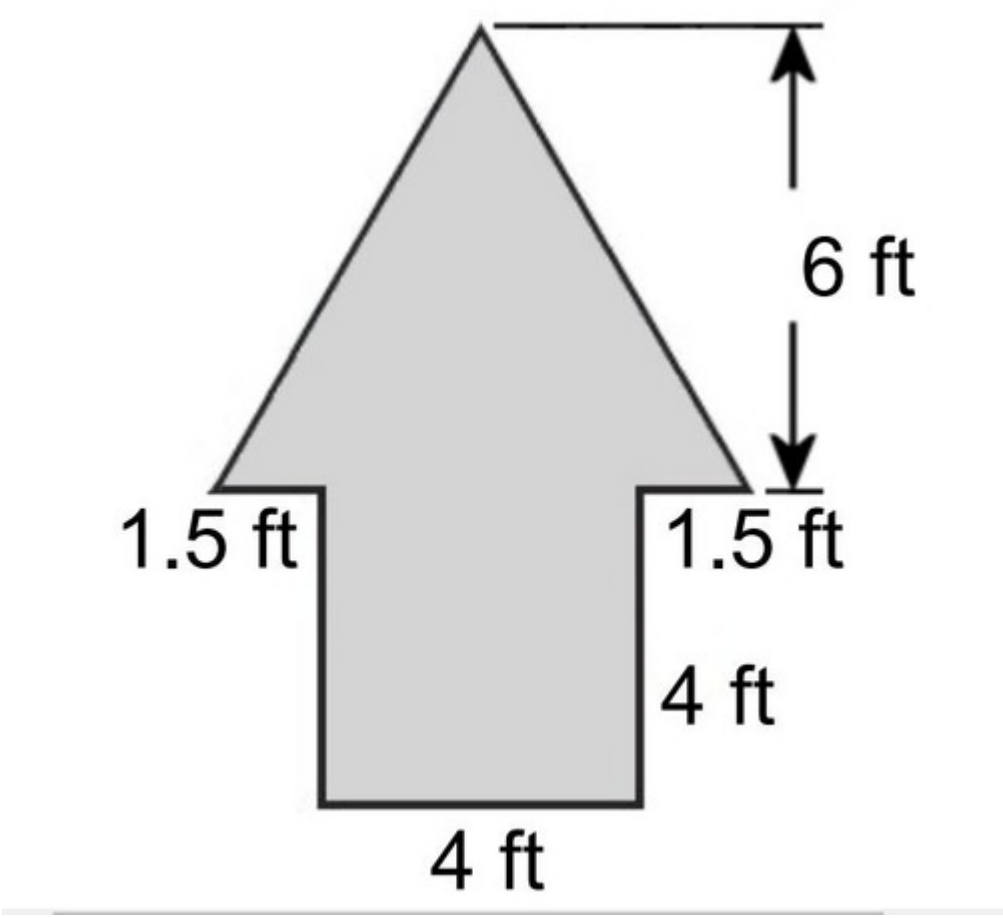


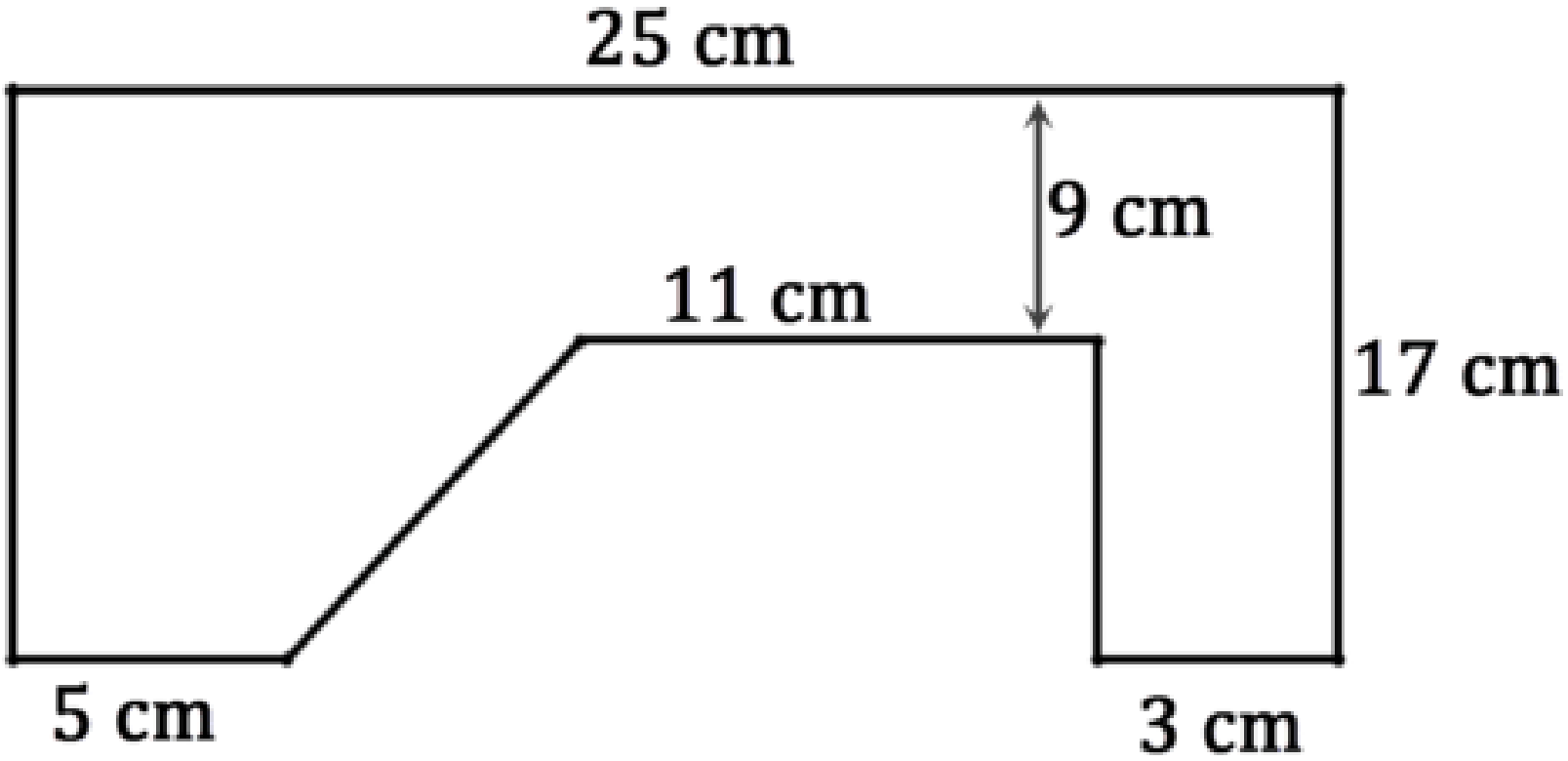
3



4



5 – The Challenge



You can do it!

Answers – don't peak!

1

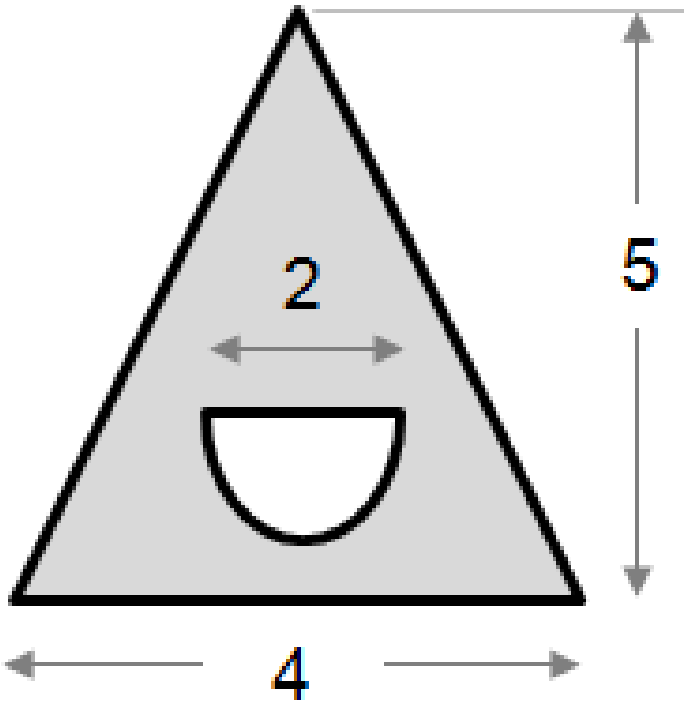
Rectangle – Circle divided by two

$(1/2 \times 4 \times 5) - (3.14 \times 1^2)/2$

$(10) - 3.14/2$

$10 - 1.57$

8.43 units squared



2

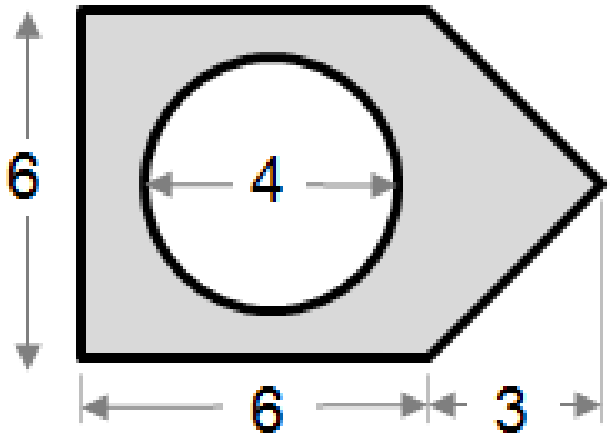
Don’t divide the circle by two. It’s a FULL circle

Square + triangle – circle

$(6 \times 6) + (1/2 \times 6 \times 3) - (3.14 \times 2^2)$

$36 + 9 - 12.56$

32.44 units squared



3

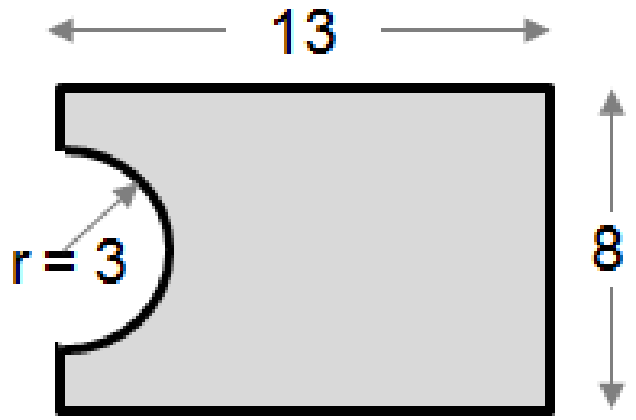
Rectangle – Circle/2

$(13 \times 8) - (3.14 \times 3^2)/2$

$104 - 28.26/2$

$104 - 14.13$

89.87 units squared



4

Square + Triangle

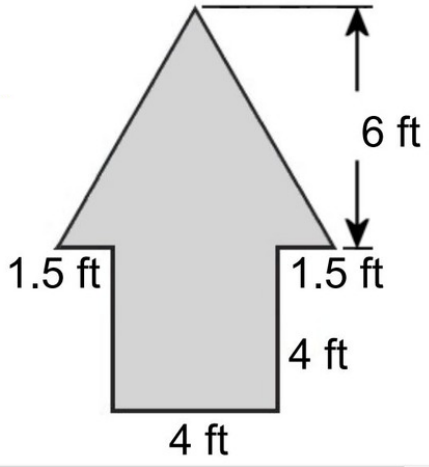
(4 x 4) + (1/2 x 7 x 6)

16 + 21

37 ft^2

How to find the base of the triangle.

You have 1.5 ft at the bottom left and right of the triangle. The missing measurement between is the square (4ft)
4 + 1.5 + 1.5 = 7 ft



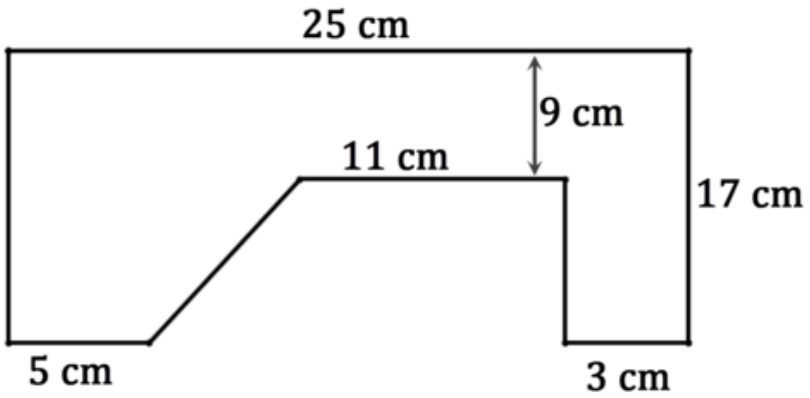
5 – The challenge

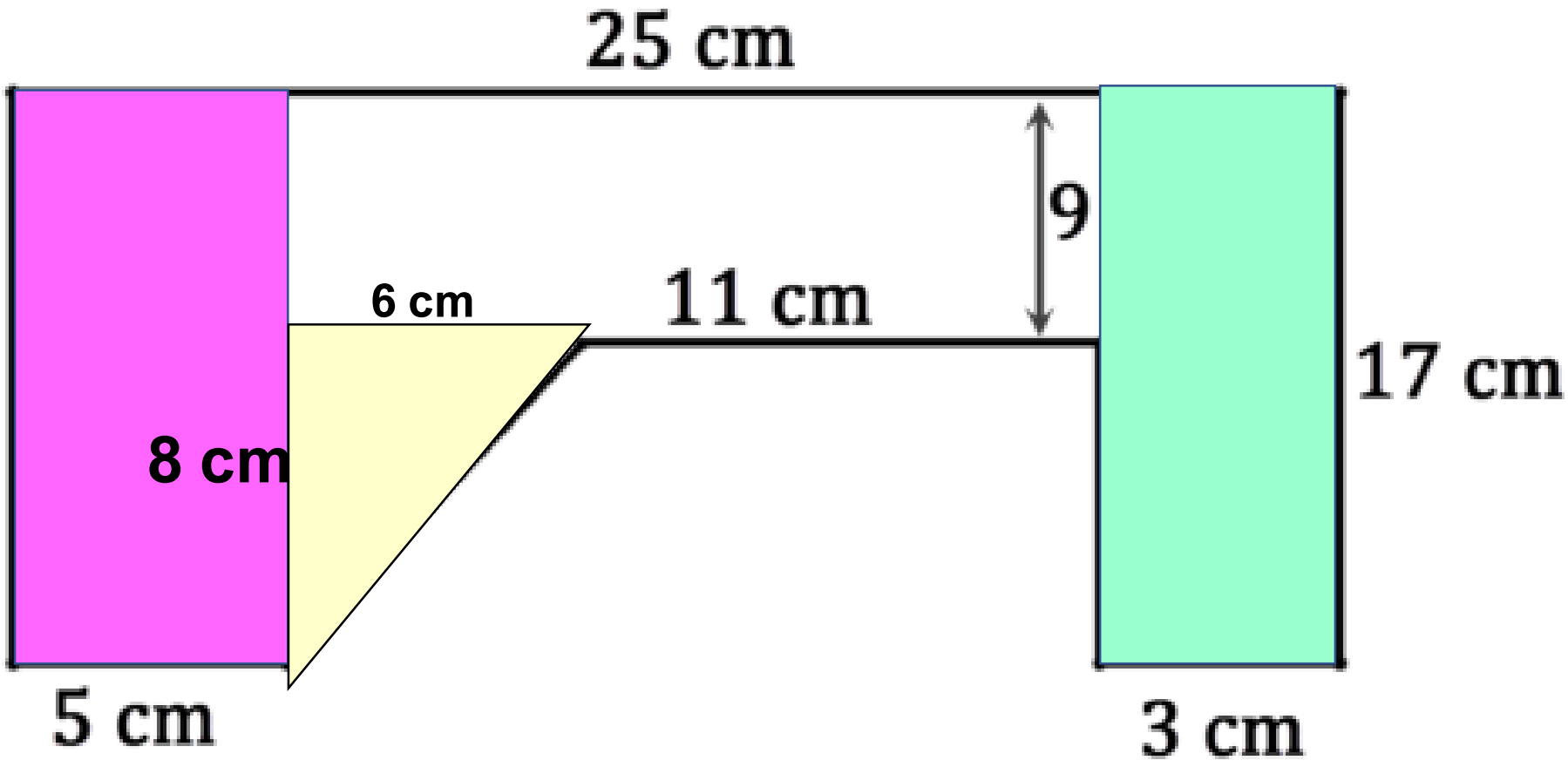
(3 x 17) + **(5 x 17)** + (17 x 9) + (1/2 x 6 x 8)

51 + 85 + 153 + 24

313 cm^2

The colors go with the shapes on the next slide




25 cm
9
6 cm
11 cm
17 cm
8 cm
5 cm
3 cm