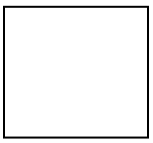
Perimeter and Area of Figures

We're going to address perimeter first. The prefix "peri-" means "around", and we use a meter to measure distance or length, so "perimeter" means the "distance around" an object. Some times, memorizing the formulas for perimeters is more trouble than just remembering that we're counting up all of the sides of a figure!

For rectangles:

One property of rectangles is that opposite sides are equal. There are 2 lengths and 2 widths. Hence the formula P = 2L + 2W.

For squares:

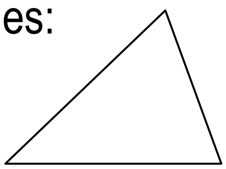


Squares are special rectangles. They have four equal Sides, which is why the formula is sometimes stated As P = 4s, where "s" is the side length.

For parallelograms:

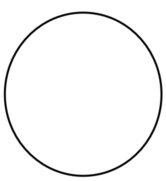
Parallelograms have opposite sides that are equal, like rectangles do. In fact, rectangles are special parallelograms having right angles. So, the perimeter is the same, too.

For triangles:



Triangles have no special formula. We just count up the outsides. I mention outsides because sometimes there's a height given inside the triangle. That's strictly for the area formula.

For circles:



The Greeks believed the circle was the perfect shape! The perimeter of the circle is commonly called the *circumference*. Where does the formula come from? Let's examine a few circles! We're measuring in centimeters.

Item to be Measured	Circumference	Diameter	$\frac{\text{Circumference}}{\text{Diameter}}$
Trash Can			
Clock			
Drink Can			

Notice the values in the final column! Do they remind you of any particular number?

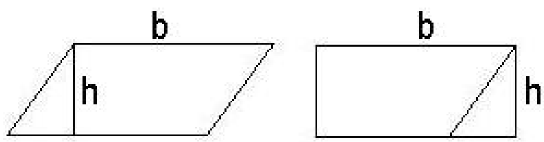
So, it turns out that for any circle, the $\frac{\text{Circumference}}{\text{Diameter}}$ is a constant number, referred to as pi, or π.

Since $\pi = \frac{\text{Circumference}}{\text{Diameter}}$, then if we multiply both sides of our formula by the diameter, then we have Diameter • π = Circumference, or
2 • Radius • π = Circumference ($2\pi r = C$)

Area

We've been dealing with areas of rectangles and squares (A = l • w or b • h) since the beginning of the class. It turns out that the formulas for the other figures we're dealing with are based on that of a rectangle as well, even the circle formula. While we don't really talk about parallelograms very much, it's important to look at the area formula so that we can talk about the others.

For parallelograms:

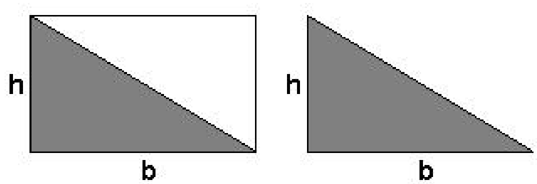


A = ________

For triangles:

A of the rectangle = ________

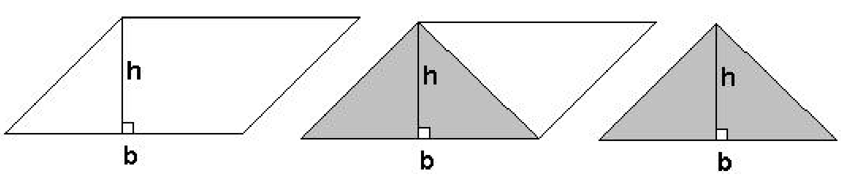
Right triangle –



A of the triangle = __________

Oblique triangle –

A of parallelogram = ________

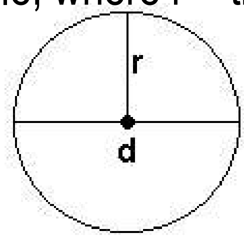


A of triangle = _________

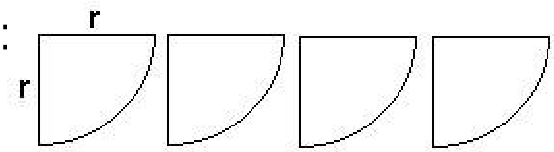
In both cases, the area of a triangle is __________!

Area of a Circle:

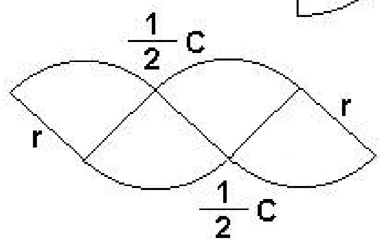
We're going to start with a circle, where r = the radius and d = the diameter.



Then, we'll cut it into four equally sized pieces:

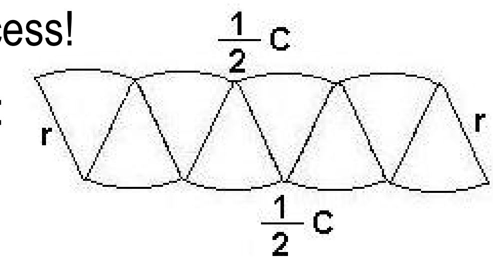


And rearrange the pieces:



It doesn't look like much yet, but let's repeat the process!

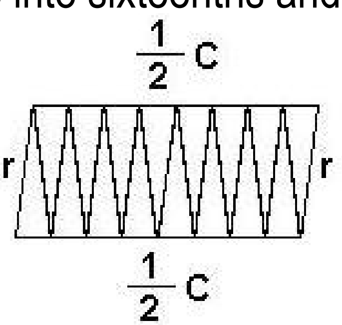
Cut a circle into eighths and rearrange as previously:



What shape is this starting to look like?

Repeat the process one last time. Cut the circle into sixteenths and rearrange:

What shape does this look like now?



If we continue this process over and over again, eventually the pieces will resemble a rectangle.

The area of a rectangle: ________________

The "length" or "base" of this figure is ____________; the "width" or "height" of this figure is __________. So, the area = _____________ = _____________

Remember, $C = 2\pi r$ = _____________ = _____________.

And this is where the area formula for a circle comes from!