Perimeter - Area Relationships

Learning Goal:

By the end of today, I will be able to calculate the area and perimeter for various two dimensional shapes.

Perimeter is the length or distance around the OUTSIDE of an object.

Area is the space COVERED by the object.

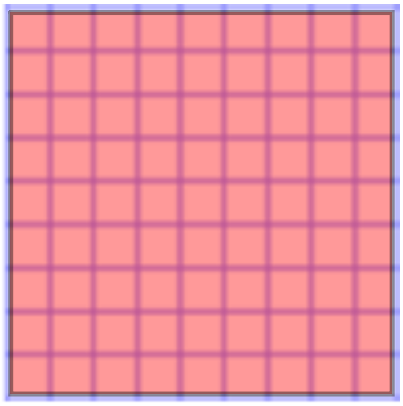
The following square has a Perimeter of _____

and an Area of _____

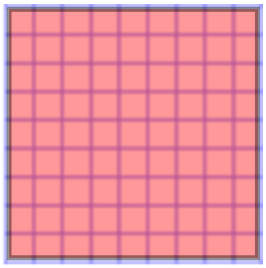
We use formulas to save us the time of counting each square.

9 cm

9 cm



Formulas that save us time:



Area of a Rectangle (or Square)

A = length x width

A = length x height

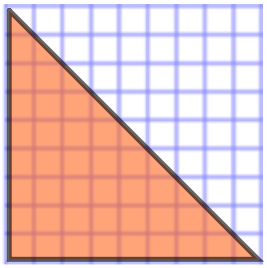
A = width x width

A = "side" x "side" (the names are not all that important)

$$A = \underset{\text{rectangle}}{l \times w} \quad or \quad \underset{\text{square}}{A = s^2}$$

Formulas that save us time:

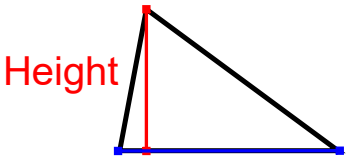
Area of a Triangle (half of a rectangle)

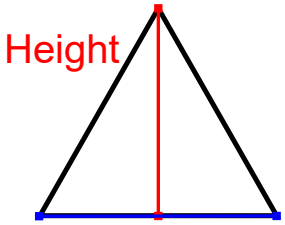


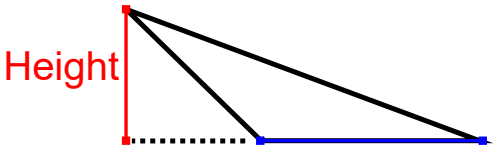
A = one half of the base time the height

$$A = \frac{bh}{2} \quad or \quad A = \frac{1}{2}bh \quad or \quad A = \frac{1}{2}(bh)$$

** It should be noted that the base and the height ALWAYS meet at ninety degrees.



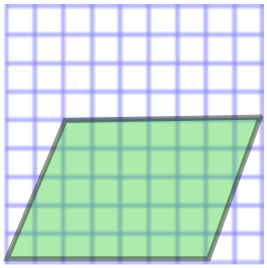




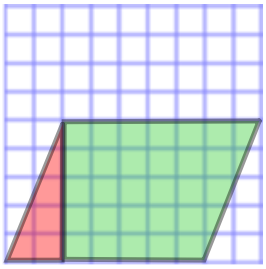
Formulas that save us time:

Area of a Parallelogram

A = the base times the height (not the end length)



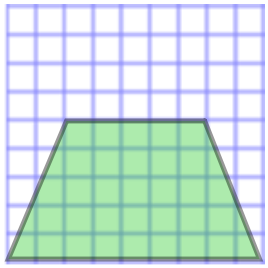
$$A = bh$$ (note it's the same formula as a rectangle)



(slide the red triangle)

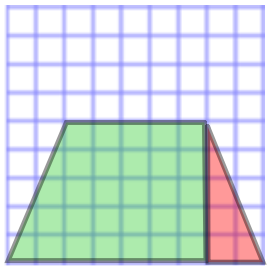
Formulas that save us time:

Area of a Trapezoid



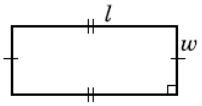
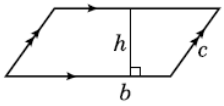
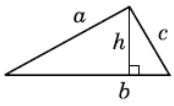
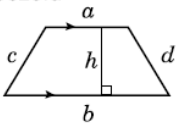
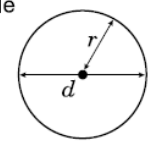
A = the "AVERAGE length" times the height

$$A = \frac{(a+b)}{2}h \quad or \quad A = \frac{1}{2}(a+b)h \quad or \quad A = \frac{(a+b)h}{2}$$

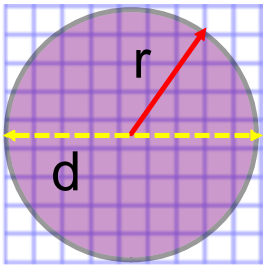


(transform the red triangle)

2D Shapes

Geometric Figure	Perimeter	Area
Rectangle 	$P = l + l + w + w$ or $P = 2(l + w)$	$A = lw$
Parallelogram 	$P = b + b + c + c$ or $P = 2(b + c)$	$A = bh$
Triangle 	$P = a + b + c$	$A = \frac{bh}{2}$ or $A = \frac{1}{2}bh$
Trapezoid 	$P = a + b + c + d$	$A = \frac{(a + b)h}{2}$ or $A = \frac{1}{2}(a + b)h$
Circle 	$C = \pi d$ or $C = 2\pi r$	$A = \pi r^2$

Formulas that save us time:



Area of a Circle

A = pi times the radius squared

$$A = \pi r^2$$

Since a circle does not have any true sides, the perimeter of a circle is given a different name. The perimeter of a circle is called the circumference and is calculated with the following formula.

$$C = 2\pi r \quad or \quad C = \pi d$$

where "r" is the radius and "d" is the diameter (twice the radius)

Consolidation Questions:

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- page 512 #1, 3a,b