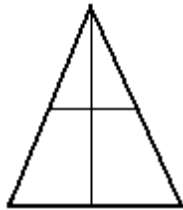


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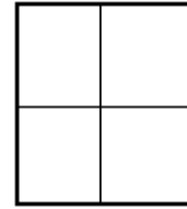
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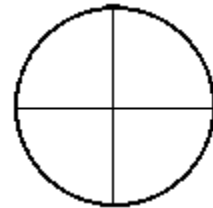
The area of a square or rectangle can be calculated by multiplying the width times the height. A 4" by 4" square surface is $4 \times 4 = 16$ square inches.



The area of a triangle is almost as easy to calculate. Multiply the height times the width, and divide the product by two. A 4" wide by 4" high triangle is $4 \times 4 = 16$, and $16 \div 2 = 8$.

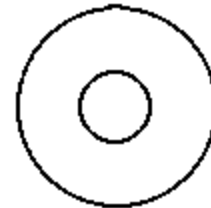


The area of a circle is little harder. The formula is πr^2 . This means the diameter is divided by 2 to get r (radius); then multiply $r \times r$ (r^2); and multiply r^2 by π (pi, 3.1416). To figure the diameter of a 3" circle, divide 3 by 2 = 1.5; multiply $1.5 \times 1.5 = 2.25$; and then multiply $2.25 \times 3.1416 = 5.3916$. This can usually rounded off to two decimal points or 5.39 square inches (in^2).

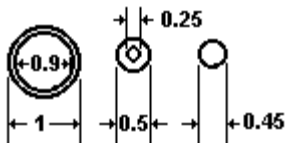


1. Many hydraulic pistons are round surfaces. What is the area of a servo piston that has a 3.6" diameter?
 $3.6 / 2 = 1.8 \times 1.8 = 3.24 \times 3.1416 = 10.17 \text{ in}^2$

2. Most clutch pistons have a hole in the center. To figure their area, figure the area of the center hole, and subtract this area from the area of the larger, outside diameter circle. What is the area of this piston if the larger diameter is 5" and the inside diameter is 1.5"?"
 $5 / 2 = 2.5 \times 2.5 = 6.25 \times 3.1416 = 19.63 \text{ in}^2$
 $1.5 / 2 = 0.75 \times 0.75 = 0.56 \times 3.1416 = 1.77 \text{ in}^2$
 $19.63 - 1.77 = 17.86 \text{ in}^2$



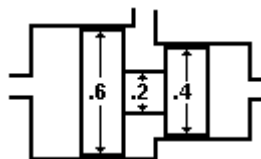
3. The area of circles will sometimes fool you. Which of these three circles has the largest area?



$1 / 2 = 0.5 \times 0.5 = 0.25 \times 3.1416 = 0.78$; $0.9 / 2 = 0.45 \times 0.45 = 0.2 \times 3.1416 = 0.63$; $0.78 - 0.63 = 0.15 \text{ in}^2$
 $0.5 / 2 = 0.25 \times 0.25 = 0.06 \times 3.1416 = 0.2$; $0.25 / 2 = 0.125 \times 0.125 = 0.015$;
 $0.2 - 0.015 = 0.185 \text{ in}^2$ Largest Area
 $0.45 / 2 = 0.225 \times 0.225 = 0.05 \times 3.1416 = 0.157 \text{ in}^2$

0.15 in², 0.185 in², 0.157 in²
X

4. Many valves have two or more diameters, what is the effective area of the left land of this valve? 0.94 in²
 What is the effective area of the right land? 0.126 in²
 What is effective area of the land at the left side of the valley? 0.909 in²
 What is effective area of the land at the right side of the valley? 0.095 in²
 Which way will this valve move with pressure in the center? To the left
 If there was a hydraulic pressure of 10 psi, how strong would that force be? 8.14 pounds



$0.6 / 2 = 0.3 \times 0.3 = 0.09 \times 3.1416 = 0.94$
 $0.4 / 2 = 0.2 \times 0.2 = 0.04 \times 3.1416 = 0.126$
 $0.2 / 2 = 0.1 \times 0.1 = 0.01 \times 3.1416 = 0.031$
 $0.94 - 0.031 = 0.909$
 $0.126 - 0.031 = 0.095$
 $0.909 - 0.095 = 0.814 \times 10 = 8.14$