

## Formulas

### Area

- Area of a Rectangle:  $A = lw$  or  $A = bh$   
Multiply the length times the width. This finds the amount of space inside a rectangle. Square the label.
- Area of a Parallelogram:  $A = bh$   
Multiply the base times height. This finds the amount of space inside a parallelogram. Square the label.
- Area of a Triangle:  $A = \frac{bh}{2}$  or  $A = \frac{1}{2}bh$   
Multiply the base times the height and then divide by two. This finds the amount of space inside a triangle. Square the label.
- Area of a trapezoid:  $A = \frac{(b_1 + b_2)h}{2}$  or  $A = \frac{1}{2}(b_1 + b_2)h$   
Add the two bases together. Then multiply by this by the height. Finally, divide this amount by two. This finds the amount of space inside a trapezoid. Square the label.
- Area of a circle:  $A = \pi r^2$   
Multiply the radius times the radius times pi (3.14). This finds the amount of space inside a circle. Square the label.

### Circumference

- Circumference of a circle when the radius is known:  $C = 2\pi r$   
Multiply two times pi (3.14) times the radius. This finds the distance around a circle.
- Circumference of a circle when the diameter is known:  $C = \pi d$   
Multiply the diameter times pi (3.14). This finds the distance around a circle.

### Perimeter

- Add the sides. This finds the distance around a figure.

### Volume

- Volume of a prism:  $V = Bh$   
Find the area of one base. Multiply this by the height. This will tell you how much space is inside the prism. Cube the label.
- Volume of a cylinder:  $V = Bh$

Multiply the radius times the radius times pi (3.14) times the height. This will tell you how much space is inside the cylinder. Cube the label.

- Volume of a pyramid:  $V = \frac{Bh}{3}$  or  $V = \frac{1}{3}Bh$

Find the area of the base using the area formulas above. Multiply this area by height and divide by 3. This will tell you how much space is inside the pyramid. Cube the label.

- Volume of a sphere:  $V = \frac{4}{3}\pi r^3$

Multiply  $\frac{4}{3}$  times pi (3.14) times the radius times the radius times the radius. (Yes, you do multiply with the radius three times!) This will tell you the amount of space inside the sphere. Cube the label.

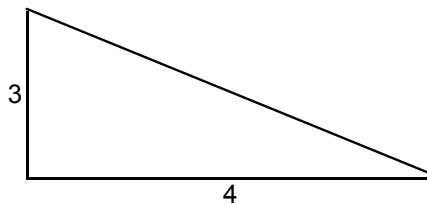
## Surface Area

- Find the area of every side using the area formulas above. Add these areas together.

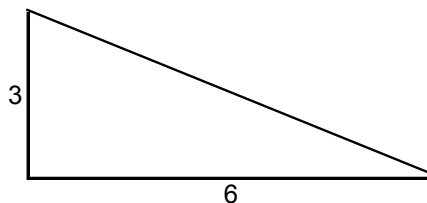
## Pythagorean Theorem

- $a^2 + b^2 = c^2$  The legs of the triangle are the sides next to the right angle. These must be a and b. The hypotenuse of the triangle is the other side (across from the right angle) and must be side c. This theorem will find a missing side in a right triangle.

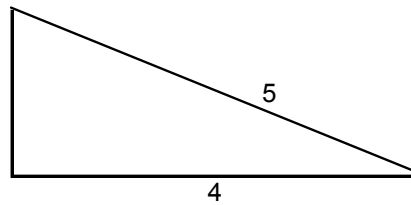
Examples:



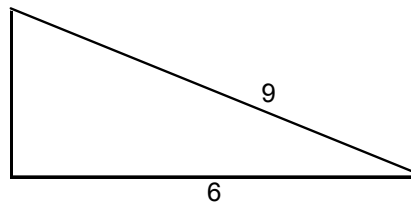
$$\begin{aligned}a^2 + b^2 &= c^2 \\3^2 + 4^2 &= c^2 \\9 + 16 &= c^2 \\25 &= c^2 \\\sqrt{25} &= c \\5 \text{ units} &= c\end{aligned}$$



$$\begin{aligned}
 a^2 + b^2 &= c^2 \\
 3^2 + 6^2 &= c^2 \\
 9 + 36 &= c^2 \\
 45 &= c^2 \\
 \sqrt{45} &= c \\
 6.7 \text{ units} &\approx c
 \end{aligned}$$



$$\begin{aligned}
 a^2 + b^2 &= c^2 \\
 a^2 + 4^2 &= 5^2 \\
 a^2 + 16 &= 25 \\
 a^2 &= 25 - 16 \\
 a^2 &= 9 \\
 a &= \sqrt{9} \\
 a &= 3 \text{ units}
 \end{aligned}$$



$$\begin{aligned}
 a^2 + b^2 &= c^2 \\
 a^2 + 6^2 &= 9^2 \\
 a^2 + 36 &= 81 \\
 a^2 &= 81 - 36 \\
 a^2 &= 45 \\
 a &= \sqrt{45} \\
 a &\approx 6.7 \text{ units}
 \end{aligned}$$

## Distance

- Distance formula:  $D = rt$   
Multiply the rate times the time to find distance.

- Distance formula:  $R = \frac{d}{t}$   
Divide the distance by time to get the rate.
- Distance formula:  $T = \frac{d}{r}$   
Divide the distance by the rate to get the time.

## Probability

- Experimental probability =  $\frac{\text{favorable outcomes that occurred}}{\text{total number of experiments}}$
- Theoretical probability =  $\frac{\text{favorable outcomes}}{\text{total outcomes}}$

## Interest

- Interest formula:  $I = prt$   
Multiply the principal times the rate times the time

## Symbols

### Sets

$\mathbb{C}$  set

$\emptyset$  the empty set

$\subseteq$  is a subset of

$\cup$  union

$\cap$  intersection

### Comparing amounts

$<$  is less than

$>$  is greater than

$\geq$  is greater than or equal to

$\leq$  is less than or equal to

$=$  is equal to

$\neq$  is not equal to

### Number Sense symbols

% percent

3:5 the ratio of 3 to 5

$|a|$  the absolute value of a

$\approx$  is approximately equal to

! factorial

$\sqrt{\quad}$  square root

$\sqrt[3]{\quad}$  cubed root

... continue in the same pattern

### Measurement symbols

$^{\circ}$  degree

$\pi$  pi (3.14)

$\cong$  is congruent to

$\sim$  is similar to

$\sphericalangle$  angle

' foot

" inch

### Algebra symbols

$f(n)$  function, f of n

### Data and Probability symbols

$P(\quad)$  the probability of

${}_n P_r$  permutations of n things taken r at a time

${}_n C_r$  combinations of things taken r at a time

### Geometry symbols

$\perp$  is perpendicular to

$\parallel$  is parallel to

$\Delta$  triangle

$\overline{AB}$  segment AB

$\overrightarrow{AB}$  ray AB

$\longleftrightarrow$  line AB