**Mathematics Reference Sheet**

**Area**
- Triangle: \( A = \frac{1}{2}bh \)
- Rectangle: \( A = lw \)
- Trapezoid: \( A = \frac{1}{2}h(b_1 + b_2) \)
- Parallelogram: \( A = bh \)
- Circle: \( A = \pi r^2 \)

**KEY**
- \( b = \text{base} \)
- \( d = \text{diameter} \)
- \( h = \text{height} \)
- \( r = \text{radius} \)
- \( \ell = \text{length} \)
- \( A = \text{area} \)
- \( w = \text{width} \)
- \( C = \text{circumference} \)
- S.A. = surface area
- \( V = \text{volume} \)
- B = area of base

**Use 3.14 or \( \frac{22}{7} \) for \( \pi \)**

**Circumference**
- \( C = \pi d = 2\pi r \)

**Surface Area**
1. Surface area of a prism or pyramid equals the sum of the areas of all faces.
2. Surface area of a cylinder equals the sum of the areas of the bases and the area of its rectangular wrap.

\[
S.A. = 2(\pi r^2) + 2(\pi rh)
\]

3. Surface area of a sphere: \( S.A. = 4\pi r^2 \)

**Volume**
1. Volume of a prism or cylinder equals the Area of the Base (\( B \)) times the height (\( h \)).
   \( V = Bh \)
2. Volume of a pyramid or cone equals \( \frac{1}{3} \) times the Area of the Base (\( B \)) times the height (\( h \)).
   \( V = \frac{1}{3} Bh \)
3. Volume of a sphere: \( V = \frac{4}{3} \pi r^3 \)
### Pythagorean theorem: $a^2 + b^2 = c^2$

![Pythagorean theorem diagram]

### Simple interest formula: $I = prt$

$I =$ simple interest, $p =$ principal, $r =$ rate, $t =$ time.

### Distance formula: $d = rt$

$d =$ distance, $r =$ rate, $t =$ time.

### Conversions

<table>
<thead>
<tr>
<th>Unit Conversion</th>
<th>Unit Conversion</th>
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</thead>
<tbody>
<tr>
<td>1 yard = 3 feet = 36 inches</td>
<td>1 cup = 8 fluid ounces</td>
</tr>
<tr>
<td>1 mile = 1,760 yards = 5,280 feet</td>
<td>1 pint = 2 cups</td>
</tr>
<tr>
<td>1 acre = 43,560 square feet</td>
<td>1 quart = 2 pints</td>
</tr>
<tr>
<td>1 hour = 60 minutes</td>
<td>1 gallon = 4 quarts</td>
</tr>
<tr>
<td>1 minute = 60 seconds</td>
<td>1 pound = 16 ounces</td>
</tr>
<tr>
<td>1 liter = 1000 milliliters = 1000 cubic centimeters</td>
<td>1 ton = 2,000 pounds</td>
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<tr>
<td>1 meter = 100 centimeters = 1000 millimeters</td>
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<tr>
<td>1 kilometer = 1000 meters</td>
<td></td>
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<tr>
<td>1 gram = 1000 milligrams</td>
<td></td>
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<tr>
<td>1 kilogram = 1000 grams</td>
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</tbody>
</table>

Metric numbers with four digits are presented without a comma (e.g., 9960 kilometers). For metric numbers greater than four digits, a space is used instead of a comma (e.g., 12 500 liters).