Algebra 1 End-of-Course and Geometry End-of-Course Assessments Reference Sheet

### Area

<table>
<thead>
<tr>
<th>Shape</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parallelogram</td>
<td>$A = bh$</td>
</tr>
<tr>
<td>Triangle</td>
<td>$A = \frac{1}{2}bh$</td>
</tr>
<tr>
<td>Trapezoid</td>
<td>$A = \frac{1}{2}h (b_1 + b_2)$</td>
</tr>
<tr>
<td>Circle</td>
<td>$A = \pi r^2$</td>
</tr>
<tr>
<td>Regular Polygon</td>
<td>$A = \frac{1}{2}aP$</td>
</tr>
</tbody>
</table>

**KEY**

- $b$ = base
- $A$ = area
- $h$ = height
- $B$ = area of base
- $w$ = width
- $C$ = circumference
- $d$ = diameter
- $V$ = volume
- $r$ = radius
- $P$ = perimeter
- $\ell$ = slant height of base
- $a$ = apothem
- $S.A.$ = surface area

*Use 3.14 or $\frac{22}{7}$ for $\pi$."

### Volume/Capacity

<table>
<thead>
<tr>
<th>Shape</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Rectangular Prism</td>
<td>$V = bh$ or $V = Bh$</td>
</tr>
<tr>
<td>Right Circular Cylinder</td>
<td>$V = \pi r^2h$ or $V = Bh$</td>
</tr>
<tr>
<td>Right Square Pyramid</td>
<td>$V = \frac{1}{3}Bh$</td>
</tr>
<tr>
<td>Right Circular Cone</td>
<td>$V = \frac{1}{3} \pi r^2h$ or $V = \frac{1}{3}Bh$</td>
</tr>
<tr>
<td>Sphere</td>
<td>$V = \frac{4}{3} \pi r^3$</td>
</tr>
</tbody>
</table>

**Total Surface Area**

<table>
<thead>
<tr>
<th>Shape</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rectangular Prism</td>
<td>$S.A. = 2bh + 2bw + 2hw$ or $S.A. = Ph + 2B$</td>
</tr>
<tr>
<td>Right Circular Cylinder</td>
<td>$S.A. = 2\pi rh + 2\pi r^2$ or $S.A. = 2\pi rh + 2B$</td>
</tr>
<tr>
<td>Right Square Pyramid</td>
<td>$S.A. = \frac{1}{2} P\ell + B$</td>
</tr>
<tr>
<td>Right Circular Cone</td>
<td>$S.A. = \frac{1}{2} (2\pi r) \ell + B$</td>
</tr>
<tr>
<td>Sphere</td>
<td>$S.A. = 4\pi r^2$</td>
</tr>
</tbody>
</table>

### Circumference

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

### Sum of the measures of the interior angles of a polygon

$= 180(n - 2)$

### Measure of an interior angle of a regular polygon

$= \frac{180(n - 2)}{n}$

where:

- $n$ represents the number of sides
Slope formula
\[ m = \frac{y_2 - y_1}{x_2 - x_1} \]
where \( m \) = slope and \((x_1, y_1)\) and \((x_2, y_2)\) are points on the line

Slope-intercept form of a linear equation
\[ y = mx + b \]
where \( m \) = slope and \( b \) = y-intercept

Point-slope form of a linear equation
\[ y - y_1 = m(x - x_1) \]
where \( m \) = slope and \((x_1, y_1)\) is a point on the line

Distance between two points
\[ P_1(x_1, y_1) \text{ and } P_2(x_2, y_2) \]
\[ \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} \]

Midpoint between two points
\[ P_1(x_1, y_1) \text{ and } P_2(x_2, y_2) \]
\[ \left( \frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right) \]

Quadratic formula
\[ x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \]
where \( a, b, \) and \( c \) are coefficients in an equation of the form \( ax^2 + bx + c = 0 \)

Trigonometric Ratios
\[ \sin A^\circ = \frac{\text{opposite}}{\text{hypotenuse}} \]
\[ \cos A^\circ = \frac{\text{adjacent}}{\text{hypotenuse}} \]
\[ \tan A^\circ = \frac{\text{opposite}}{\text{adjacent}} \]

Special Right Triangles
\[ x^{60^\circ} \quad 2x \quad 30^\circ \quad x^{\sqrt{3}} \]
\[ x^{45^\circ} \quad \sqrt{2} \quad 45^\circ \quad x \]

Conversions
1 yard = 3 feet
1 mile = 1,760 yards = 5,280 feet
1 acre = 43,560 square feet
1 hour = 60 minutes
1 minute = 60 seconds

1 cup = 8 fluid ounces
1 pint = 2 cups
1 quart = 2 pints
1 gallon = 4 quarts
1 pound = 16 ounces
1 ton = 2,000 pounds

1 meter = 100 centimeters = 1000 millimeters
1 kilometer = 1000 meters
1 liter = 1000 milliliters = 1000 cubic centimeters
1 gram = 1000 milligrams
1 kilogram = 1000 grams