

# PreCal 0–100 Quiz Study Guide (Quarter 2)

## Shapes

Sphere Surface Area:  $S = 4\pi r^2$

Sphere Volume:  $V = \frac{4}{3}\pi r^3$

Cone Surface Area:  $S = \pi r^2 + \pi r l$

Cone Volume:  $V = \frac{1}{3}\pi r^2 h$

Cylinder Surface Area:  $S = 2\pi r^2 + 2\pi r h$

Cylinder Volume:  $V = \pi r^2 h$

Area of a Triangle:  $A = \frac{1}{2}bh$

Area of an Equilateral Triangle:  $A = \frac{s^2\sqrt{3}}{4}$

## Equations

Slope-Intercept Form:  $y = mx + b$

Point-Slope Form:  $y - y_1 = m(x - x_1)$

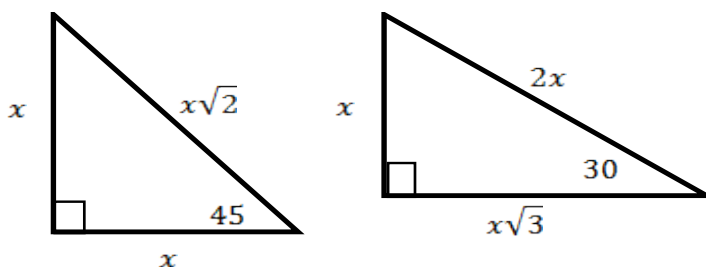
Standard Form:  $Ax + By = C$

Vertex Form (quadratic):  $y = a(x - h)^2 + k$

Equation of a Circle:  $(x - h)^2 + (y - k)^2 = r^2$

Standard Trig Form:  $y = a\sin(bx - c) + d$

## Special Right Triangles



## Quadratics

Quadratic Formula:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Vertex of a Quadratic:

$$\left( \frac{-b}{2a}, f\left(\frac{-b}{2a}\right) \right)$$

Quadratic Axis of Symmetry:

$$x = \frac{-b}{2a}$$

## Basic Trigonometry

$$\sin\theta = \frac{\textit{opposite}}{\textit{hypotenuse}}$$

$$\cos\theta = \frac{\textit{adjacent}}{\textit{hypotenuse}}$$

$$\tan\theta = \frac{\textit{opposite}}{\textit{adjacent}}$$

## Factoring

Difference of two Squares:

$$A^2 - B^2 = (A - B)(A + B)$$

Sum of two Cubes:

$$A^3 + B^3 = (A + B)(A^2 - AB + B^2)$$

Difference of two Cubes:

$$A^3 - B^3 = (A - B)(A^2 + AB + B^2)$$

### Converting Radians and Degrees

Degrees to Radians:  $\text{deg} \cdot \frac{\pi}{180} = \text{rad}$

Radians to Degrees:  $\text{rad} \cdot \frac{180}{\pi} = \text{deg}$

### Quotient Properties

$$\tan \theta = \frac{\sin \theta}{\cos \theta}$$

$$\cot \theta = \frac{\cos \theta}{\sin \theta}$$

### Trig Using x, y, and r

$$\sin \theta = \frac{y}{r}$$

$$\cos \theta = \frac{x}{r}$$

$$\tan \theta = \frac{y}{x}$$

$$\csc \theta = \frac{r}{y}$$

$$\sec \theta = \frac{r}{x}$$

$$\cot \theta = \frac{x}{y}$$

### Reciprocal Identities

$$\sin \theta = \frac{1}{\csc \theta}$$

$$\cos \theta = \frac{1}{\sec \theta}$$

$$\tan \theta = \frac{1}{\cot \theta}$$

$$\csc \theta = \frac{1}{\sin \theta}$$

$$\sec \theta = \frac{1}{\cos \theta}$$

$$\cot \theta = \frac{1}{\tan \theta}$$

### Even/Odd Properties

$$\sin(-\theta) = -\sin(\theta)$$

$$\csc(-\theta) = -\csc(\theta)$$

$$\cos(-\theta) = \cos(\theta)$$

$$\sec(-\theta) = \sec(\theta)$$

$$\tan(-\theta) = -\tan(\theta)$$

$$\cot(-\theta) = -\cot(\theta)$$