

STAAR ALGEBRA II REFERENCE MATERIALS



GENERAL FORMULAS

Slope of a line

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

Quadratic formula

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

FACTORING

Difference of squares

$$a^2 - b^2 = (a - b)(a + b)$$

Difference of cubes

$$a^3 - b^3 = (a - b)(a^2 + ab + b^2)$$

Sum of cubes

$$a^3 + b^3 = (a + b)(a^2 - ab + b^2)$$

LOGARITHMS

Product

$$\log_b(xy) = \log_b x + \log_b y$$

Quotient

$$\log_b\left(\frac{x}{y}\right) = \log_b x - \log_b y$$

Power

$$\log_b(x^r) = r \log_b x$$

CONIC SECTIONS

General form

$$Ax^2 + Bxy + Cy^2 + Dx + Ey + F = 0$$

Circle

$$(x - h)^2 + (y - k)^2 = r^2$$

Parabola

$$(x - h)^2 = 4p(y - k)$$

$$(y - k)^2 = 4p(x - h)$$

Ellipse

$$\frac{(x - h)^2}{a^2} + \frac{(y - k)^2}{b^2} = 1$$

$$\frac{(y - k)^2}{a^2} + \frac{(x - h)^2}{b^2} = 1$$

Hyperbola

$$\frac{(x - h)^2}{a^2} - \frac{(y - k)^2}{b^2} = 1$$

$$\frac{(y - k)^2}{a^2} - \frac{(x - h)^2}{b^2} = 1$$

STAAR ALGEBRA II REFERENCE MATERIALS

CIRCUMFERENCE

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

AREA

Triangle $A = \frac{1}{2}bh$

Rectangle or parallelogram $A = bh$

Rhombus $A = \frac{1}{2}d_1d_2$

Trapezoid $A = \frac{1}{2}(b_1 + b_2)h$

Regular polygon $A = \frac{1}{2}aP$

Circle $A = \pi r^2$

SURFACE AREA

	Lateral	Total
Prism	$S = Ph$	$S = Ph + 2B$
Pyramid	$S = \frac{1}{2}Pl$	$S = \frac{1}{2}Pl + B$
Cylinder	$S = 2\pi rh$	$S = 2\pi rh + 2\pi r^2$
Cone	$S = \pi rl$	$S = \pi rl + \pi r^2$
Sphere		$S = 4\pi r^2$

VOLUME

Prism or cylinder $V = Bh$

Pyramid or cone $V = \frac{1}{3}Bh$

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