**Algebra**

Exponents

x0 = 1

Quadratics

General form:

Discriminant:

Imaginary Numbers

Pythagorean Theorem:

a

c

b

Distance:

Midpoint:

Linear Equations:

Slope:

Point-Slope Form:

Slope-Intercept Form:

Standard Form:

Intercept Form:

Horizontal Line: x = a

Vertical Line: y = b

Absolute Value Inequalities: GO LA!

GO – Greater than, OR

LA – Less than, AND (between)

**Geometry (2D)**

**Rectangle:**

Area = L∙W

Perimeter = 2L + 2W

**Triangle:**

Area = bh

Perimeter = sum of sides

**Circle:**

Area = πr2

Circumference = 2πr

**Parallelogram:**

Area = bh

**Trapezoid:**

Area = h(a + b)

**Geometry (3D)**

**Rectangular Prism (Box):**

Surface Area = 2LW + 2LH + 2WH

Volume = L∙W∙H

**Sphere:**

Surface Area = 4πr2

Volume = πr3

**Cylinder:**

Surface Area = 2πr2 + 2πrh

Volume = πr2h

**Cone:**

Surface Area =

Volume = πr2h

**Pyramid:**

Surface Area = (area of the base) + (number of base sides)(b)

Volume = (area of the base) × h

**Trigonometry**

Pythagorean Identities:

sin2 *x* + cos2 *x* = 1

1 + tan2 *x* = sec2*x*

1 + cot2 *x* = csc2 *x*

Law of Sines:

Law of Cosines:

c2 = a2 + b2 – 2ab(cosC)

b2 = a2 + c2 – 2ac(cosB)

a2 = b2 + c2 – 2bc(cosA)

**Logarithms**

by = x means the same as log b x = y

(exponential form) (logarithmic form)

where b is the base (positive number, b≠1)

y is the exponent

x is the argument (x > 0, cannot have a log of a negative number)

log b 1 = 0

log b b = 1

Log of a Product log b x·y = log b x + log b y

Log of a Quotient log b  = log b x – log b y

Power log b xc = c·log b x

Identity If log b x = log b y , then x = y.

Change of base a, b, x >0 , a≠1, b≠1

**Unit Circle (cosine, sine)**

0°, 360°

(1 , 0)

0, 2π

30°

60°

45°

90°

120°

135°

150°

180°

330°

225°

210°

240°

270°

300°

315°

(– 1, 0)

(0 , 1)

(0, – 1)

π

**Probability and Statistics**

Probability =

Odds =

Permutation:

Combination:

**Calculus**

Derivatives

*c* is a constant

*c* is a constant

Integrals

*k* is a constant

*n* ≠ -1

*k* is a constant

a > 0, a ≠ 1

Circles:

General Form: x2 + y2 + Dx + Ey + F = 0

Center–Radius Form: (x – h)2 + (y – k)2 = r2

Parabolas:

General Form I: y2 + Dx + Ey + F = 0

General Form II: x2 + Dx + Ey + F = 0

h/k Form I: (y – k)2 = 4a(x – h)

h/k Form II: (x – h)2 = 4a(y – k)

Ellipses:

Standard Form I:

Standard Form II:

Foci: c2 = a2 – b2

Hyperbolas:

Standard Form I: Asymptote:

Standard Form II: Asymptote:

Foci: c2 = a2 + b2