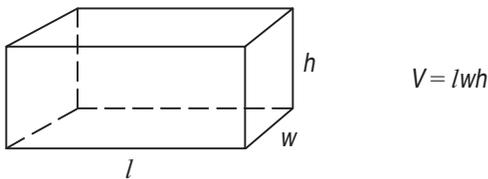
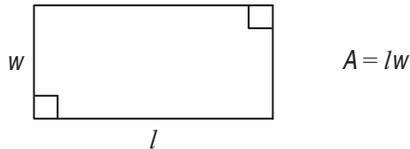


## ALGEBRA I FORMULA SHEET

Formulas that you may need to solve questions on this exam are found below.

You may use calculator  $\pi$  or the number 3.14.



## Linear Equations

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

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

**Slope-Intercept Formula:**  $y = mx + b$

**Standard Equation of a Line:**  $Ax + By = C$

## Arithmetic Properties

**Additive Inverse:**  $a + (-a) = 0$

**Multiplicative Inverse:**  $a \cdot \frac{1}{a} = 1$

**Commutative Property:**  $a + b = b + a$   
 $a \cdot b = b \cdot a$

**Associative Property:**  $(a + b) + c = a + (b + c)$   
 $(a \cdot b) \cdot c = a \cdot (b \cdot c)$

**Identity Property:**  $a + 0 = a$   
 $a \cdot 1 = a$

**Distributive Property:**  $a \cdot (b + c) = a \cdot b + a \cdot c$

**Multiplicative Property of Zero:**  $a \cdot 0 = 0$

**Additive Property of Equality:**  
If  $a = b$ , then  $a + c = b + c$

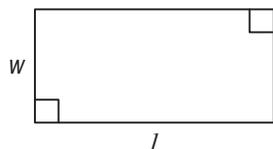
**Multiplicative Property of Equality:**  
If  $a = b$ , then  $a \cdot c = b \cdot c$

## ALGEBRA II FORMULA SHEET

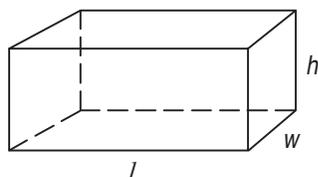
Formulas that you may need to solve questions on this exam are found below.

You may use calculator  $\pi$  or the number 3.14.

## Shapes



$$A = lw$$



$$V = lwh$$

## Data Analysis

**Permutation:**  ${}_n P_r = \frac{n!}{(n-r)!}$

**Combination:**  ${}_n C_r = \frac{n!}{r!(n-r)!}$

## Exponential Properties

$$a^m \cdot a^n = a^{m+n} \qquad (a^m)^n = a^{m \cdot n}$$

$$\frac{a^m}{a^n} = a^{m-n} \qquad a^{-1} = \frac{1}{a}$$

## Powers of the Imaginary Unit

$$i = \sqrt{-1} \qquad i^2 = -1$$

$$i^3 = -i \qquad i^4 = 1$$

## Logarithmic Properties

$$\log_a x = y \leftrightarrow x = a^y \qquad \log x = y \leftrightarrow x = 10^y \qquad \ln x = y \leftrightarrow x = e^y$$

$$\log_a (x \cdot y) = \log_a x + \log_a y$$

$$\log_a x^p = p \cdot \log_a x$$

$$\log_a \frac{x}{y} = \log_a x - \log_a y$$

## Quadratic Functions

**General Formula:**  $f(x) = ax^2 + bx + c$

**Standard (Vertex) Form:**  $f(x) = a(x - h)^2 + k$

**Factored Form:**  $f(x) = a(x - x_1)(x - x_2)$

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

when  $ax^2 + bx + c = 0$  and  $a \neq 0$

## Compound Interest Equations

**Annual:**  $A = P(1 + r)^t$   $A$  = account total after  $t$  years

**Periodic:**  $A = P \left( 1 + \frac{r}{n} \right)^{nt}$   $P$  = principal amount

$r$  = annual rate of interest

$t$  = time (years)

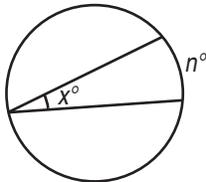
**Continuous:**  $A = Pe^{rt}$   $n$  = number of periods interest is compounded per year

# GEOMETRY FORMULA SHEET – PAGE 1

Formulas that you may need to solve questions on this exam are found below.  
 You may use calculator  $\pi$  or the number 3.14.

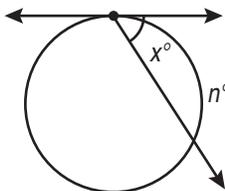
### Properties of Circles

Angle measure is represented by  $x$ . Arc measure is represented by  $m$  and  $n$ . Lengths are given by  $a$ ,  $b$ ,  $c$ , and  $d$ .



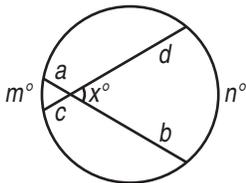
#### Inscribed Angle

$$x = \frac{1}{2}n$$



#### Tangent-Chord

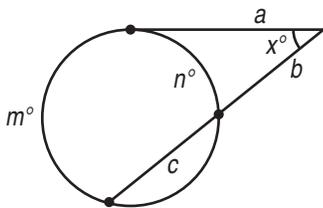
$$x = \frac{1}{2}n$$



#### 2 Chords

$$a \cdot b = c \cdot d$$

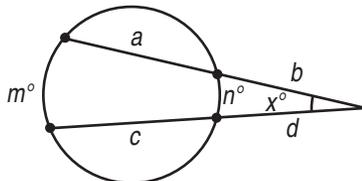
$$x = \frac{1}{2}(m + n)$$



#### Tangent-Secant

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

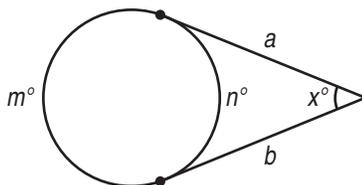
$$x = \frac{1}{2}(m - n)$$



#### 2 Secants

$$b(a + b) = d(c + d)$$

$$x = \frac{1}{2}(m - n)$$

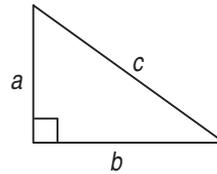


#### 2 Tangents

$$a = b$$

$$x = \frac{1}{2}(m - n)$$

### Right Triangle Formulas

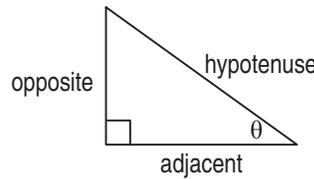


#### Pythagorean Theorem:

If a right triangle has legs with measures  $a$  and  $b$  and hypotenuse with measure  $c$ , then...

$$a^2 + b^2 = c^2$$

#### Trigonometric Ratios:



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

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

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

### Coordinate Geometry Properties

**Distance Formula:**  $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

**Midpoint:**  $\left( \frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$

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

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

**Slope Intercept Formula:**  $y = mx + b$

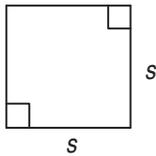
**Standard Equation of a Line:**  $Ax + By = C$

## GEOMETRY FORMULA SHEET – PAGE 2

Formulas that you may need to solve questions on this exam are found below.

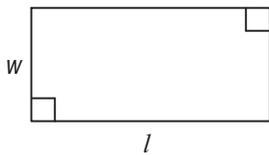
You may use calculator  $\pi$  or the number 3.14.

### Plane Figure Formulas



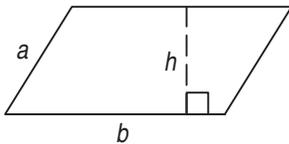
$$P = 4s$$

$$A = s \cdot s$$



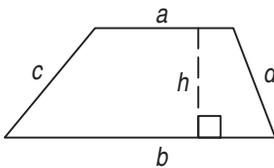
$$P = 2l + 2w$$

$$A = lw$$



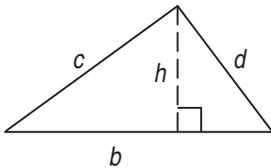
$$P = 2a + 2b$$

$$A = bh$$



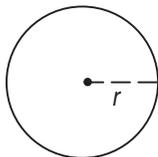
$$P = a + b + c + d$$

$$A = \frac{1}{2}h(a + b)$$



$$P = b + c + d$$

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

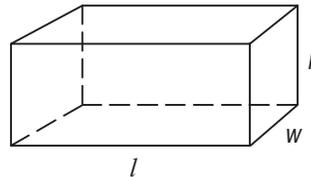


$$C = 2\pi r$$

$$A = \pi r^2$$

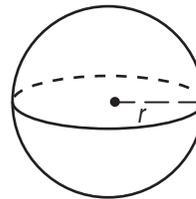
Sum of angle measures =  $180(n - 2)$ ,  
where  $n$  = number of sides

### Solid Figure Formulas



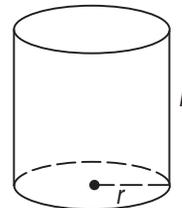
$$SA = 2lw + 2lh + 2wh$$

$$V = lwh$$



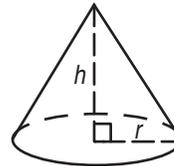
$$SA = 4\pi r^2$$

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



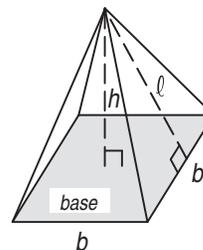
$$SA = 2\pi r^2 + 2\pi rh$$

$$V = \pi r^2 h$$



$$SA = \pi r^2 + \pi r\sqrt{r^2 + h^2}$$

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



$$SA = (\text{Area of the base}) +$$

$$\frac{1}{2}(\text{number of sides})(b)(l)$$

$$V = \frac{1}{3}(\text{Area of the base})(h)$$

#### Euler's Formula for Polyhedra:

$$V - E + F = 2$$

vertices minus edges plus faces = 2