

The formulas below are provided to students during testing in both the online testing platform and the printed test booklet. This page may be printed for instructional use during the school year, but it MAY NOT be used as scratch paper during test administration.

## Linear Formulas

### Slope Formula

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

### Linear Equations

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

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

Standard Form:  $Ax + By = C$

### Arithmetic Sequence Formulas

Recursive:  $a_n = a_{n-1} + d$

Explicit:  $a_n = a_1 + d(n - 1)$

## Exponential Formulas

### Exponential Equation

$$y = ab^x$$

### Geometric Sequence Formulas

Recursive:  $a_n = r(a_{n-1})$

Explicit:  $a_n = a_1 \cdot r^{n-1}$

### Compound Interest Formula

$$A = P\left(1 + \frac{r}{n}\right)^{nt}$$

## Quadratic Formulas

### Quadratic Equations

Standard Form:  $y = ax^2 + bx + c$

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

Factored Form:  $y = a(x - r)(x - s)$

### Quadratic Formula

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

## Average Rate of Change

The change in the  $y$ -value divided by the change in the  $x$ -value for two distinct points on a graph.

## Statistics Formulas

### Mean

$$\bar{x} = \frac{x_1 + x_2 + x_3 + \dots + x_n}{n}$$

The mean is the sum of all the data values divided by the total number of data values.

### Interquartile Range

$$IQR = Q_3 - Q_1$$

The difference between the first quartile and third quartile of a set of data.

### Mean Absolute Deviation

$$\frac{\sum_{i=1}^n |x_i - \bar{x}|}{n}$$

The sum of the distances between each data value and the mean, divided by the number of data values.

### Outliers

Outliers are more than 1.5 times the interquartile range below the first quartile or above the third quartile.

### Distance Formula

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

### Midpoint of a Line Segment

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