

Midterm Formulas

Linear Equations

- Slope-Intercept

$$y = mx + b$$

slope

y-intercept

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

- Point Slope Form:

$$y - y_1 = m(x - x_1)$$

slope

$(x_1, y_1) = \text{point}$

- Standard Form:

$$Ax + By = C$$

- A, B, C are Integers (No frac/decimals)
- A is positive
- GCF of ABC is 1

Properties

Commutative - order changes

• Associative - Groupings change

Distributive - Multiply through Parenthesis

Identities - Adding 0
- Multiply 1

Inverse - Adding the opposite
- Multiply by Reciprocal

Solving Inequalities

* Multiply/Divide by a negative

↳ Flip the sign

• Graphing

- Open or closed circle
(Dotted or solid line)

- Shade left or right
(down) (up)

Transformations

$$y = a(x \pm h) \pm k$$

$a > 1$ stretch
 $0 < a < 1$ compress

$+k \rightarrow$ shift up
 $-k \rightarrow$ shift down

$+h \rightarrow$ shift left
 $-h \rightarrow$ shift right

Systems

- Elimination and Substitution
-

Matrices

- Dimensions: rows $\times$ columns
- $a_{32} \rightarrow$ element in row 3,
column 2
- Multiply $4 \cdot \begin{bmatrix} 2 \\ 3 \end{bmatrix} = \begin{bmatrix} 8 \\ 12 \end{bmatrix}$
- Adding/Sub - Have to be same size

- Equal Matrices

$$\begin{bmatrix} 2x & 7 \end{bmatrix} = \begin{bmatrix} 10 & y \end{bmatrix}$$

$$2x = 10$$

$$\boxed{x = 5}$$

$$7 = y$$

$$\boxed{y = 7}$$

Quadratics

- Standard Form

$$y = Ax^2 + Bx + C$$

- A, B, C are integers
- C is y -intercept

- $-\frac{B}{2A}$ is Axis of Symmetry and x -value of vertex
- y -value of vertex, plug in AoS.
- If $A > 0 \rightarrow$ opens up
 $A < 0 \rightarrow$ opens down

* Factored Form

$$y = a(x-p)(x-q)$$

$\swarrow \quad \searrow$
 $x\text{-ints}$

- * Factored to Standard $\rightarrow$ use FOIL.

