

Midpoint and Length and Circles

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

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

Circles

The distance from the origin to any point on a circle (that is centered at the origin) is the length of the radius

Equation of a Circle:

$$x^2 + y^2 = r^2$$

Substitution:

Method of Substitution: solving a linear system by substituting for one variable from one equation into the other equation.

Steps to Substitution

1. Isolate a variable (choose the easiest one).
2. Substitute this expression into the second equation.
3. Combine like terms (remember order of operations).
4. Solve for the variable.
5. Substitute that value into one of the original equations and solve for the second variable.

Chapter 1/2

Elimination:

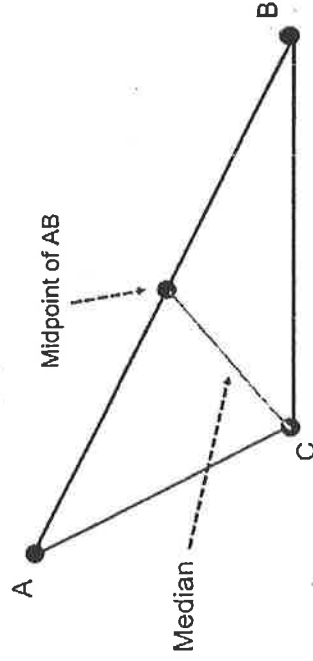
Elimination: Solving a linear system by adding or subtracting to eliminate one of the variables

Steps to Elimination

1. Get both equations into the form of $x + y = \#$
2. Determine how to get rid of one of the variables.
3. Add OR Subtract like terms in the equation to eliminate the chosen variable.
4. Solve the resulting equation for the remaining variable.
5. Substitute that value into one of the original equations to solve for the second variable.

Medians

Median: Line segment joining a vertex of a triangle to the midpoint of the opposite side

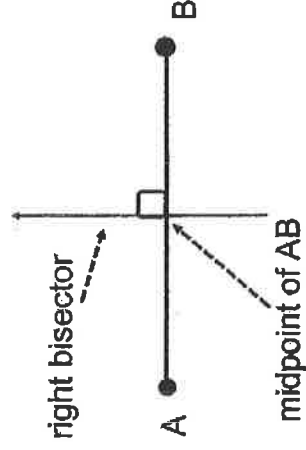


Steps to Finding the Equation of a Median

- 1) Determine the coordinates of the midpoint of the side that is opposite the vertex
- 2) Find the slope of the line that connects the vertex to the midpoint of the opposite side
- 3) Using the coordinates of the vertex (or the midpoint of the opposite side) and the slope of the line, solve for the y-intercept of this line.
- 4) Write the equation of the line that connects the vertex to the midpoint of the opposite side in $y=mx+b$ format. Plug in your values for 'm' and 'b'.

Right Bisectors

Right Bisector: the line that passes through the midpoint of a line segment and intersects it at a 90 degree angle.



Steps to finding the equation of a Right

Bisector of Line AB

- 1) Find the slope of AB
- 2) Find the slope of the line perpendicular to AB
- 3) Find the midpoint of AB
- 4) Write the equation of the line that bisects AB and is perpendicular to it.