Rearranging Formulas

- When moving coefficients or variables in an equation from one side of the equals sign to the other, you must change the sign of the coefficient or variable.
    - Ex. $4x + 5 = 6 \rightarrow 4x = 6 - 5$
    - Ex. $4x/5 = 6y \rightarrow 4x = (6y)(5)$

Graphing Linear Equations With 2 Variables

- A **linear equation** is an equation that graphs as a straight line. When graphing linear equations you must
    a. Isolate for y (if necessary)
    b. Make a table of values (with 4 - 5 points)
    c. Plot and join the points

Graphing Linear Inequalities

- To graph a linear inequality you must:

1. Make a table of values for the corresponding equation
2. Plot the points
3. Join the points with a:
    a. Solid line, if you have a ‘’ or ‘’
    b. Broken line, if you have a ‘<’ or ‘>’
4. Pick a point that is not on the line
5. Substitute this point into the inequality and if the point makes the inequality:

. **True**, shade the area the point is found in

a. **False**, shade the area the point is not found in

Graphing Non-Linear Relations

- a **non-linear relation** represents a graph that is not a straight line (usually it is a smooth curve) When making a table of values for a non-linear relation, use more values for x than you would for a linear relation
    - Methods to determine whether an equation is linear or not
        - *Analysing the equation*
            - If an equation has an exponent of 2 more greater than it is non-linear
            - If all exponents are 1 (no exponents) then it is linear
        - *Analysing the graph*
            - If the line is straight then it is linear
            - If it bends/curves, it is non-linear
        - *Analysing the first differences*
            - First differences can be found by subtracting consecutive y-values
            - IF the x-value increase by equal intervals and the first differences are constant, then the equation is linear

Coordinate Geometry: Line Segments

Length of a Line Segment

- The formula used to find the length of a line segment where the endpoint coordinate points are given is either:
    - $l=(x2 - x1)2 + (y2 - y1)2$
    - $l2= (x2 - x1)2 + (y2 -y1)2$

Midpoint of a Line Segment

- The formula used to find the midpoint of a line segment where the endpoint coordinate points are given is:
    - $X1 + X22,y1 + y22$

Slope of a Line Segment

- Line segments rising to the right have positive slopes.
- Line segments falling to the left have negative slopes.
- Horizontal line segments have a slope of 0.
- Vertical line segments have an undefined slope.