# Mathematics Quiz – Graphing and Trends

**Name:**

**You may use a graphing calculator (optional), a pen or pencil and a ruler.**

- If the equation for Main Road in the town of Green Lake could be defined as 2x+3, what is the slope of the road? Explain.

- An ice-cream shop is at point (5,7) and a rival ice-cream shop is at point (7,9). What would be the most direct distance between them?

- A new proposed straight road will run through the town with the equation of 2x+5. Plot the graph that shows this.

- Find the midpoint between the lake at (2,3) and the factory at (4,6). Find the slope and then the y-intercept for a trend of such a line that these two points would fall on.

- If the x-intercept of Main Road is where it meets South Road, and a point of Main Road is (0,3). Then at what co-ordinate point would these roads meet?

- The lake is a perfect circle and two opposing points of the lake are: (2,3) and (6,7). Find the equation of a circle for the lake.

- Write an inequality that would declare the region south of Main Road, if Main Road had a slope of 2x+3.

- On the nanoscale, gold can be a red or purple colour depending on the wavelength of photon that is absorbed. Through testing, it was found that sodium citrate reduces the size of nanoparticles and that smaller nanoparticles would absorb high energy (yet small wavelengths) of particles. If volume of Sodium Citrate was plotted as the independent variable against the absorbance of a wavelength in nanometers as the dependent variable, would the trend found be increasing or decreasing? Assume a linear trend.

**CHALLENGE QUESTION (ATTEMPT)**

- Deduce which line has the greatest length from these two inequalities if there are two rules about the domain of both of these lines; $y <= 12$ and $y >= -6$

  **Line A:** $5 >= 2x + 1$
  **Line B:** $6 <= 3x + 1$

  Hint: It may be worthwhile to plot these lines if you are in doubt!

**Comments:**