

MPM1D0 – LINEAR RELATIONS GSP ASSIGNMENT

Due Date: _____

Overview

- A separate Geometer's Sketchpad (GSP) document (file) is required for each question. Each file must be named in the following way: **Question#_YourName.gsp**. (e.g. Question2_AnisahMostafa.gsp, Question3_SalmanHaider.gsp).
- A single folder called "**MPM1D0 GSP Assignment**" must be used to contain all GSP files.
- When the assignment is completed, both an electronic copy and a paper copy must be submitted. The electronic copy is submitted by copying the folder "MPM1D0 GSP Assignment" to **I:\In\YourTeacherLastName\MPM1D0\YourName**, where **YourTeacherLastName** represents your teacher's last name and **YourName** represents your name.

Questions

As outlined above, create a separate GSP document for each of the following questions.

1. Create an example that illustrates **why** any point lying on an axis must have a co-ordinate that is equal to zero. Show examples of points on both axes (**i.e.** on both the x -axis and the y -axis).
2. Create an example that illustrates **why**
 - lines that lean to the left (i.e. slope downward to the right) have negative slope and a decreasing y -co-ordinate
 - lines that lean to the right (i.e. slope upward to the right) have positive slope and an increasing y -co-ordinate
 - horizontal lines have zero slope and a constant y -co-ordinate
 - vertical lines have undefined slope and a constant x -co-ordinate
3. Create an example that illustrates **why** parallel lines must have equal slopes and **why** perpendicular lines must have negative reciprocal slopes.
4. Create an interesting picture that consists entirely of line segments. For this question, you **must not** use the line tool to produce the line segments. Instead, you must **generate** each line segment by using an **equation** of a line with a **restricted** domain. (This will be demonstrated in class.)

Requirements

(a) All your slopes and y -intercepts must be in **integer** or **fraction** form.

(e.g. numbers such as $\dots -3, -2, -1, 0, 1, 2, 3, \dots$ or $\frac{1}{2}, -\frac{3}{5}$, etc)

(b) Your picture must include at least **two** pairs of **parallel lines**.

(c) Your picture must include at least **two** pairs of **perpendicular lines**.

(d) Your picture must include at least **three horizontal lines**.

(e) Your picture must include at least **three vertical lines**.

Note: To enter the equation of a vertical line you need to select "**Graph**," then "**Plot New Function**," then "**Equation**" and change the default option " **$y = f(x)$** " into " **$x = f(y)$** ."

Helpful GSP Hints

- To define a co-ordinate system, select "**Graph**" from the menu bar, then choose "**Show Grid**."
- To generate a line with an equation, select "**Graph**" then choose "**Plot a New Function**."
- To create **restrictions** on a line, right-click on the graph of the line, select "**Properties**" then choose "**Plot**." Enter the lowest and highest values of the x -co-ordinate.
- The colour and/or thickness of a line can be changed by right-clicking on it and selecting "**Thick**" and/or "**Colour**."
- Make adjustments to your equations or restrictions to ensure that the lines connect to form your desired picture.