Lesson Plan

Grade 10 Academic Math **Lesson: 3 - 2**

Unit: Analytic Geometry **Topic: Midpoint of a Line Segment**

- ***homework check:*** **FM 10 p. 168 # 8 -14**

- ***note:*** **Midpoint of a Line Segment**

Just as suspected, the midpoint of any line segment is directly in the middle of the line. It should be noted that the middle of any two numbers can be found by dividing the sum in half, or by two. Therefore, to find the middle of a line segment, we should also be able to divide the sum of the points by two. The formula for the midpoint of a line segment is

$$\left(\frac{x_1+x_2}{2},\frac{y_1+y_1}{2}\right)$$

The midpoint of a line segment bisects it into two congruent portions. It stands to reason then, that because dividing in two makes two even portions, that dividing in three makes three equal portions and so on. You will find in analytic geometry that verifying properties is an important aspect. Recall that to verify means to prove that the property is true using mathematical communication.

Example,

a) Find the midpoint of the line segment $A(-3,7)$ and $B(4,-7)$

$$\left(\frac{x_1+x_2}{2},\frac{y_1+y_1}{2}\right)=\left(\frac{-3+4}{2},\frac{7+(-7)}{2}\right)$$

$$=\left(\frac{1}{2},0\right)$$

b) A circle with centre (0, 0) has one endpoint A(- 3, 2). Find the second endpoint of the diameter sharing point A.

****In this case, because we know the value of the midpoint coordinates, we can set up two equations, one for each coordinate.***

$$\frac{-3+x_2}{2}=0 \text{ and } \frac{2+y_2}{2}=0$$

$$-3+x_2=0 \qquad 2+y_2=0$$

$$x_2=3 \qquad y_2=-2$$

The coordinates of the second endpoint are $B(3.-2)$

- ***homework assignment:*** **Principles of Mathematics 10 p. 72 #2, 4, 6, 7, 8,12, 15, 19**