

## GEOMETRY 10B Lesson B Week 2 Mr. Dinallo

*There are two lessons for class 10b. you are to do lesson B if your name is listed below. if your name is not listed below you are to do lesson A.*

***The following student are to complete this: lesson B.***

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*Coordinate geometry lesson B*

*Learning intention: how to find the distance between two points on a graph; using a ruler and using a formula.*

**materials:** for this lesson students will need calculator/with manual, graph paper(preferable centimeters) and ruler

*you are to use your barron's textbook page 99 for this lesson. if you do not have the barron's than i have attached a copy below starting with the attachment of the left.*

***starting*** on page 99, you will notice the distance formula, if you are given two points on a graph, for example (7,12) and the other point (10,16), you can find the distance between the points.

using the distance formula, you first:

i. subtract the **x** values:  $10 - 7 = 3$

ii. subtract the **y** values:  $16 - 12 = 4$

now you *square* the differences in the values

i.  $3^2 = 9$

ii. 4 squared = 16

now you add the *squared* values

i.  $9 + 16 = 25$

final step you take the square root of the sum 25

$\text{SQRT}(25) = 5$  so the distance between points (7,12) and (10,16) is 5 units

***problem to submit:*** you can scan and submit your work: if you do not have a scanner answer the question below where is said questions.

i. plot the above point: (7,12) (10,16) on your graph

ii. on your graph draw the right triangle that is on page 99 of barron's or see

the below attachments: open the one on the left:

a) on page 99 notice the *right triangle* with *run*

b) on page 99 notice the *right triangle* with the *rise*

### **questions: |**

1) what is the distance for the *run*? how do you calculate the run? *show your work*

2) what is the distance for the *rise*? how do you calculate the rise? *show your work*

3) is the distance formula on page 99 the same as pythagorus theorem? explain.

Next:

on page 99 notice the ***mid-point*** formula.

using the points above (7,12) and (10,16) we can find the mid-point between

(7,12) and (10,16).

i. add up the x values

a)  $7 + 10 = 17$

b) divide the sum by 2:  $17/2 = 8.5$

ii. add up the y values

a)  $12 + 16 = 28$

b) divide the sum by 2:  $28/2 = 14$

thus, the mid-point for points (7,12) and (10,16) is (8.5,14)

**problem to submit:** you can scan and submit your work: if you do not have a scanner answer the question at the bottom where is said questions.

on your graph find the mid-point and compare it to the value you just calculated above.

### questions: II

1) the mid-point is really an average of the x and y values. explain why?

2) draw a line vertically down from the mid-point to the base of your right

triangle you drawn. are the two triangles similar? explain.

**Next** on page 99, "dividing a segment proportionally"

1) in this part, you are asked to divide a line into two parts: one part is one-third of the original length and other part of the line will be two-thirds of the original length: see page 99.

2) the problem want us to find the point on the line that divides the line into 2 parts; where one segment of the line is two-thirds

long. meaning that somewhere on the line, there is this point  $(x,y)$  we are looking for. you need to find this point on the line that is going to divide the line into two pieces: for this problem, one piece of the line is  $\frac{2}{3}$  and the other piece is of the line is  $\frac{1}{3}$  of the original length.

follow these steps:

i. on your graph paper, plot the points given on page 99  $J(1,-2)$  and  $K(11,3)$ .

ii. now connect the points.

iii. use the ratio to find the x value:  $(x - x_1) / (x_2 - x_1) = \frac{2}{3}$   
see page 100.

a)  $(x - x_1) / (x_2 - x_1) = \frac{2}{3}$  why two thirds? because one piece of the line is two thirds of the original length.

b) the x-values used on page 100 in the ratio equation, also known as a proportion, are taken from the points  $J(1,-2)$  and  $K(11,3)$ . following the calculation step on page 100 and solve for x.

iv. use the ratio equation, proportion, to find the y value:  $(y - y_1) / (y_2 - y_1) = \frac{2}{3}$  see page 100.

a)  $(y - y_1) / (y_2 - y_1) = \frac{2}{3}$  solve for y?

b) the y-values used on page 100 in the ratio are taken from the points  $J(1,-2)$  and  $K(11,3)$ .

*problem to submit:*

- i. calculate the distance between points  $J(1,-2)$  and  $K(11,3)$  using the distance formula from page 99. make a graph.
- ii. calculate the mid-point between  $J(1,-2)$  and  $K(11,3)$  using the mid-formula on page 99.
- iii. for points  $J(1,-2)$  and  $K(11,3)$ , find the coordinate point  $L(x,y)$  that divides line  $JK$  in a 2:5 ratio? hint following the same step on page 100.