**Activity 1.2.4 Translations Using Technology**

1. Open GeoGebra and select the *Algebra & Graphics* view from the *Perspectives* menu.

2. Display the grid by selecting the *Move* icon and clicking the drop down arrow by *Graphics* as shown below.



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| Macintosh HD:Users:phubeny:Desktop:Screen Shot 2015-02-07 at 3.46.05 PM.png3. Macintosh HD:Users:phubeny:Desktop:Screen Shot 2015-02-07 at 3.59.26 PM.png | Click the **New Point** tool and place the points on the coordinates given:*A* on (2,3), *B* on (4,1) and *C* on (5,2)**.** |
| 4.  | Next, draw triangle *ABC* using the *Polygon* tool. To do this, click the **Polygon** tool and click the points in the following order: point *A*, point *B*, point *C* and point *A* again to close the polygon. |
| 5. Macintosh HD:Users:phubeny:Desktop:Screen Shot 2015-02-07 at 4.05.15 PM.png | To display the label and the coordinates of the points, right click (control-click on a Mac) the points then click **Object Properties**to display the*Preferences* dialog box. |
| 6. In the *Basic*tab of the *Preferences*dialog box, check the *Show label* check box, and choose the *Name & Value* option in the drop-down list box, and then close the window. Your drawing should look like the figure below: (Note: If you do not turn off automatic labeling the sides may be labeled with lower case letters).Macintosh HD:Users:phubeny:Desktop:Screen Shot 2015-02-07 at 4.21.59 PM.png |
| 7.  The only remaining part of this construction is the vector tool. To construct vector $\vec{DE}$, select the **Vector** tool by clicking on the **Line** menu and selecting vector as shown below and this click the origin (0,0) and click the point with coordinates (1,2). After this step, your screen should look like the graph below.Macintosh HD:Users:phubeny:Desktop:Screen Shot 2015-02-07 at 4.30.34 PM.png |
| 8.  | To translate the object using the vector, select the **Translate Object by Vector** tool from the Transform menu, click on the triangle and then click on the vector. Notice that a translated triangle, ∆*A*’*B*’*C*’ appears after you click on the vector. Read the name of this triangle as “A prime, B prime, C prime.” |
| 9. What can you say about the original triangle object and the translated triangle |
| 10. If the coordinates of the vertices of the translated triangle are not displayed, display them using the steps we have done in step 5 and 6. |
| 11. How are the coordinates of the vertices of the original triangle and the translated triangle related? |
| 12. Experiment by moving any vertex of ∆*ABC* What happens?13. Experiment by moving points *D* and *E* to change the vector. What happens?14. As shown below, click on the **Measure** menu and select “distance or length” to measure and record the following distances:*AA'=*  *BB'=*  *CC' =* *DE'* (length of the vector) = What do you notice about the segment lengths? |