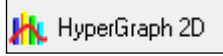


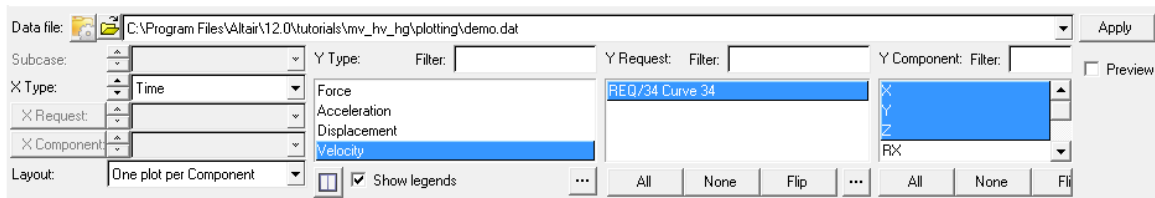


## Exercise 4a: Creating and Editing XY Plots

This exercise uses the data file, LINACC.

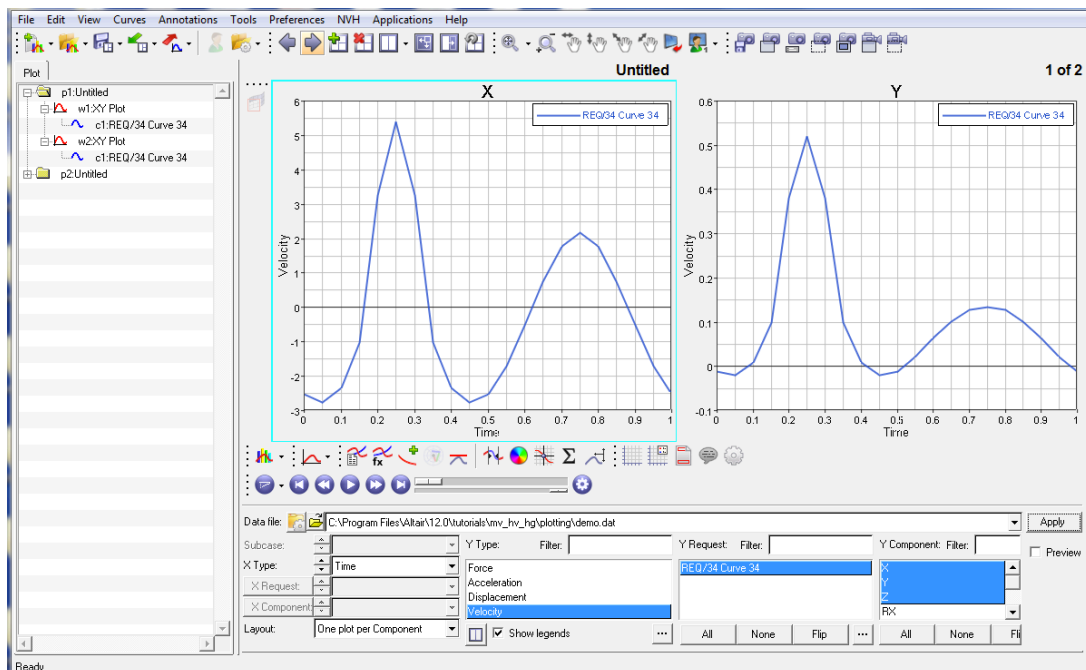
### Step 1: Load the file LINACC and create multiple plots.

1. Open HyperWorks Desktop and set the application to HyperGraph 2D, .
2. Click the **Build Plots** panel button  on the **Curves** toolbar.
3. Click on the open folder icon next to **Data file** and select the file LINACC from the location ... \ch4 \demo .dat
4. Set the **Y Type** to **Velocity**.
5. For **Y Request**, select **REQ/34 Curve 34**.
6. For **Y Component**, select **X, Y, and Z** (use the Ctrl button to select all 3 requests).
7. For **Layout**, select **One plot per Component** and select a two window layout .




8. Click **Apply** to create the plots.


Notice how there is now 2 pages with 3 new plots created.



## Step 2: Take the integral of each curve.

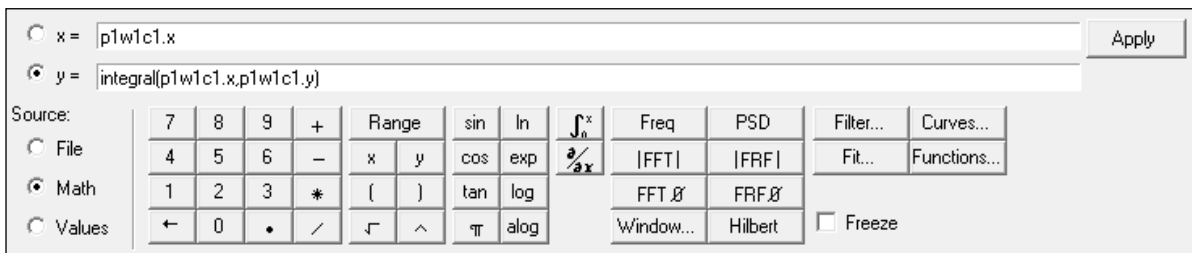
1. Make sure that Window 1 on Page 1 is the active window (it will have a cyan box surrounding the window).

2. Enter the **Define Curves** panel using the button  on the **Curves** toolbar.
3. In the panel under the **Curve** list, select **Add** to add a new curve to the active window.
4. Set the **Source** to **Math**.
5. Click in the **x =** field and then holding the Shift button, left click on the curve in Window 1.

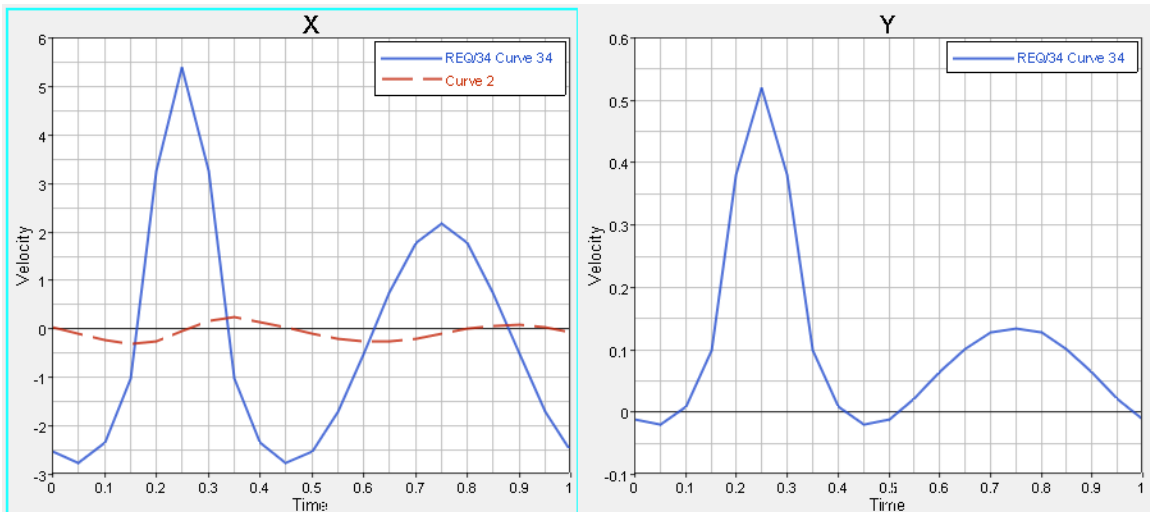
6. Click in the **y =** field and then select the integral icon, .
 

This adds the integral function to the **y =** field. Notice that there are two empty fields in the integral function. The first field is for the x vector and the second field is for the y vector.
7. Hold the Shift and Ctrl keys at the same time and then select the curve in Window 1.
 

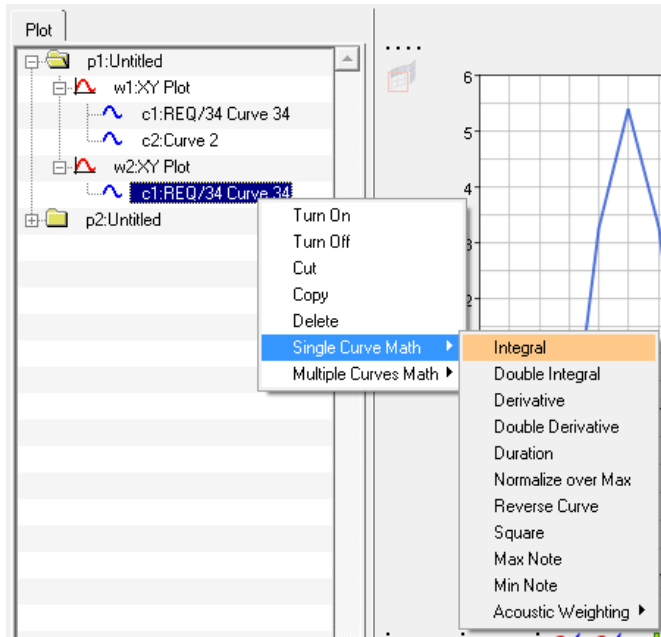
This adds the x vector to the function.
8. Then hold the Shift key and select the curve in Window 1 to add the y vector to the function.



9. Click **Apply** to create the curve.




10. Using the **Plot Browser**, select **w2:XY Plot c1: Res. Acceleration (m/s\*\*2)**, right click and select **Single Curve Math > Integral**.





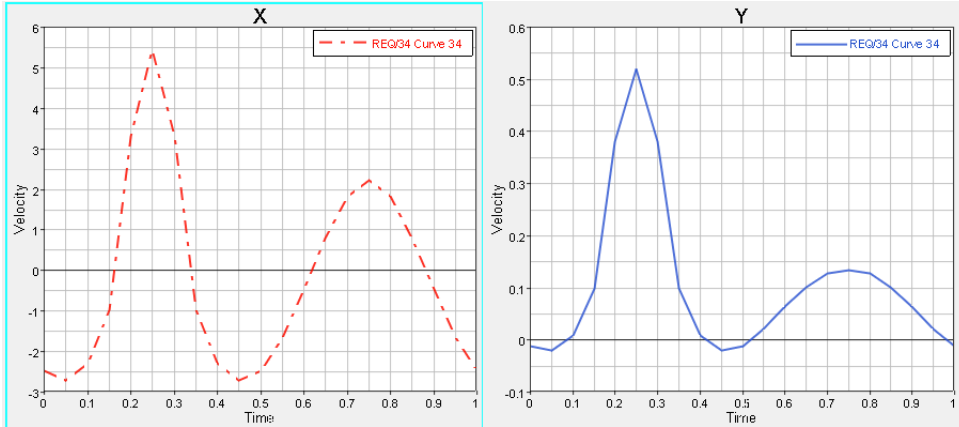
This is an additional way to create plots based on single curves and multiple curves. Notice how many of the functions available in the **Define Curves** panel are also available using the **Plot Browser**.


- Using either the **Plot Browser** or the **Define Curves** panel, turn off the display of the integrated curves. Using the **Plot Browser**, right click on the curve name and select **Turn off**. Using the **Define Curves** panel, simply select the curve in the **Curve** list and then uncheck the box next to **Curve**.

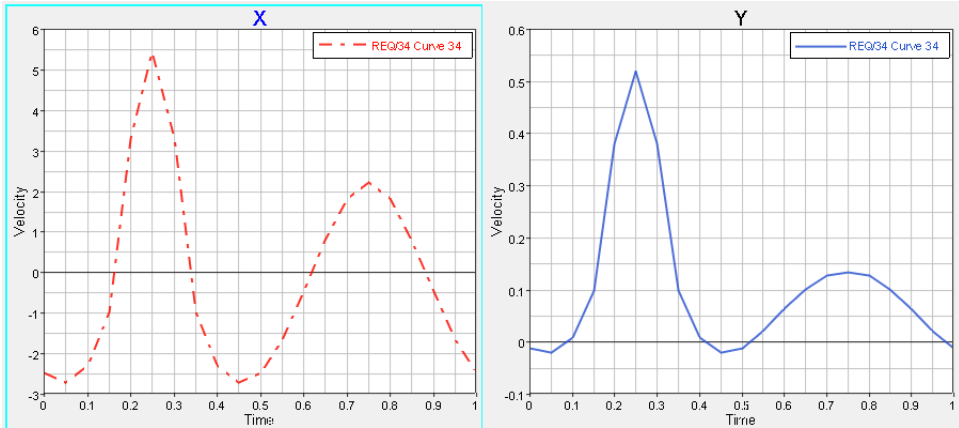
- Fit the windows as needed to return to the original display, select icon .


### Step 3: Change the curve attributes.

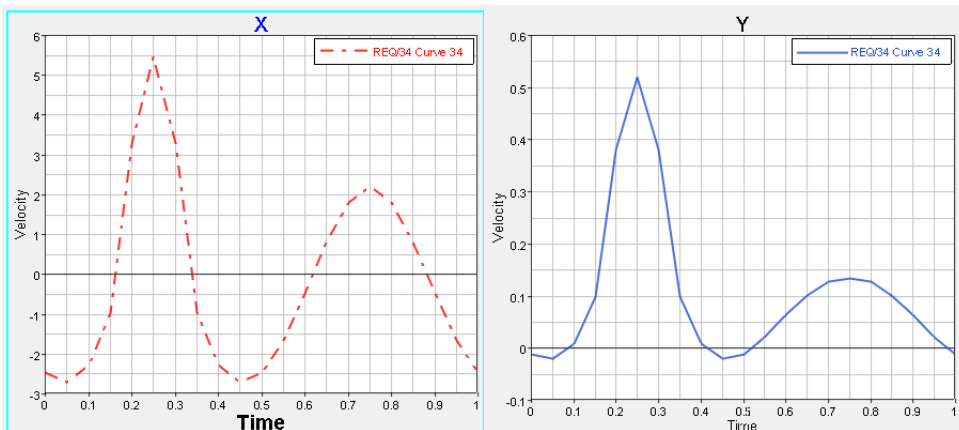
- Make sure that Window 1 on Page 1 is the active window (it will have a cyan box surrounding the window) and then select the **Curve Attribute** panel by selecting  on the **Curves** toolbar.
- From the **Curves** list, select **REQ 34/ Curve 34**.
- Under the **Line Attributes** tab, select the dot/dash line style, , select the medium line thickness, and select the red from the color pallet.




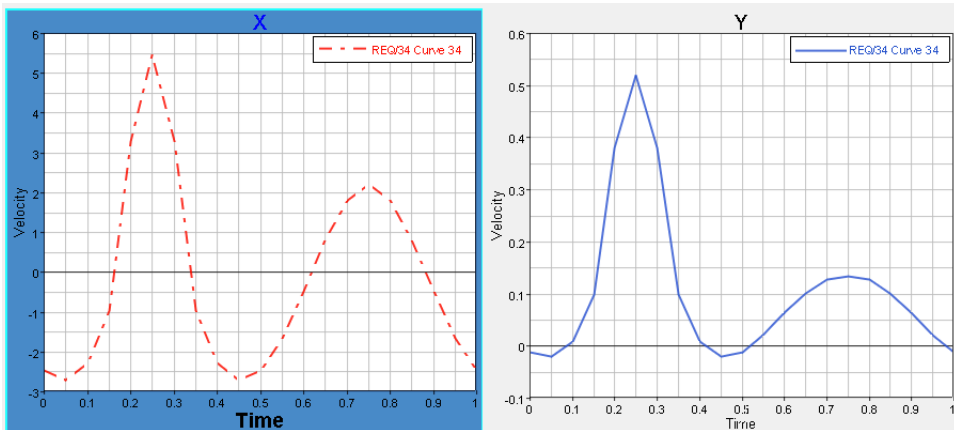
4. Click on the header for Window 1 (**X**) or select **Headers/Footers**  in the **Annotations** toolbar.
5. Make sure the **Header** tab is activated and select a different color from the color pallet (blue is selected below).



6. Click on the X Axis to enter the **Axes** panel.
7. Click on the font button, , to open the Font Selector window.
8. Set the **Font style** to **Bold** and the **Size** to **14**.

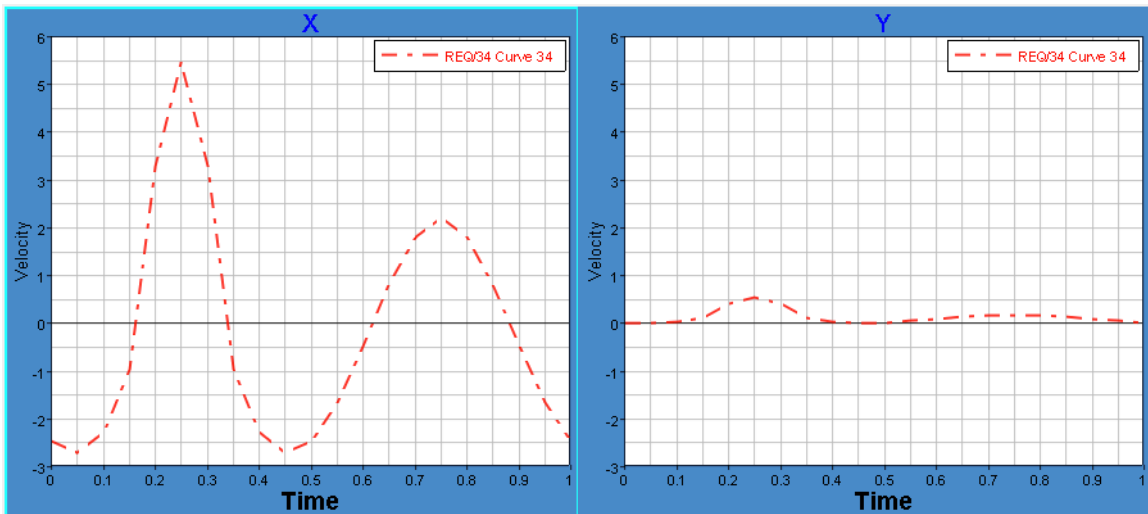


9. Enter the **Options** panel by selecting  on the **Annotations** toolbar.
10. Select the **Color** tab.
11. Select **Frame** and then select a new color for the frame of Window 1 (below a light blue has been selected).



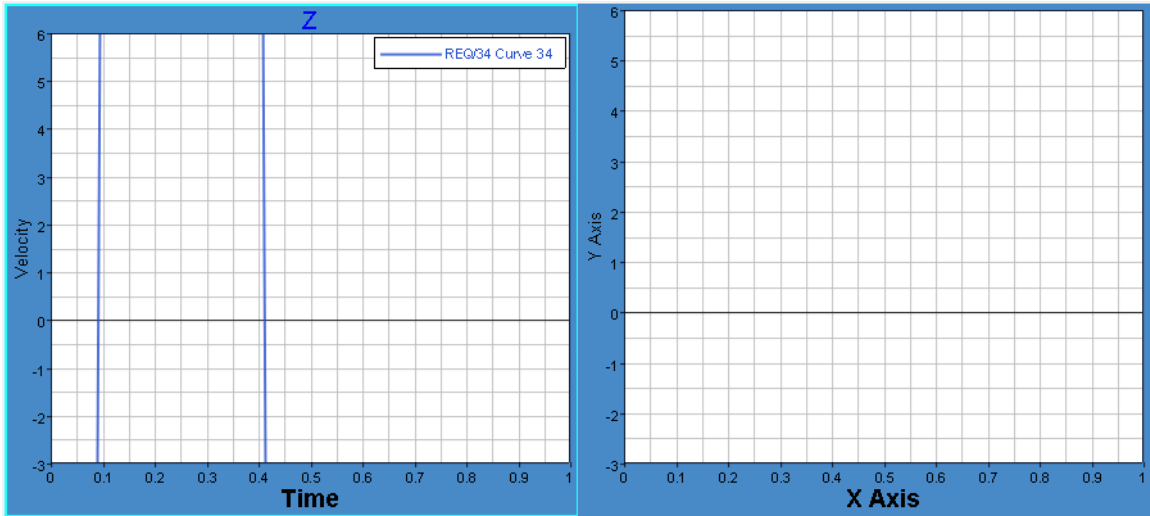
12. Right click in Window 1 and select **HG ApplyStyle....**
13. Under the **Pre Selection** (left side of window), select **Current page** from the drop down menu.
14. Within the **Apply Style** window, under **Options**, select the check boxes for **Plot**, **Header**, **Axes**, and **Curves**.
15. Click **Ok**.

Notice how the settings in Window 1 have been applied to Window 2. Also notice how the plot window on Page 2 hasn't been updated.





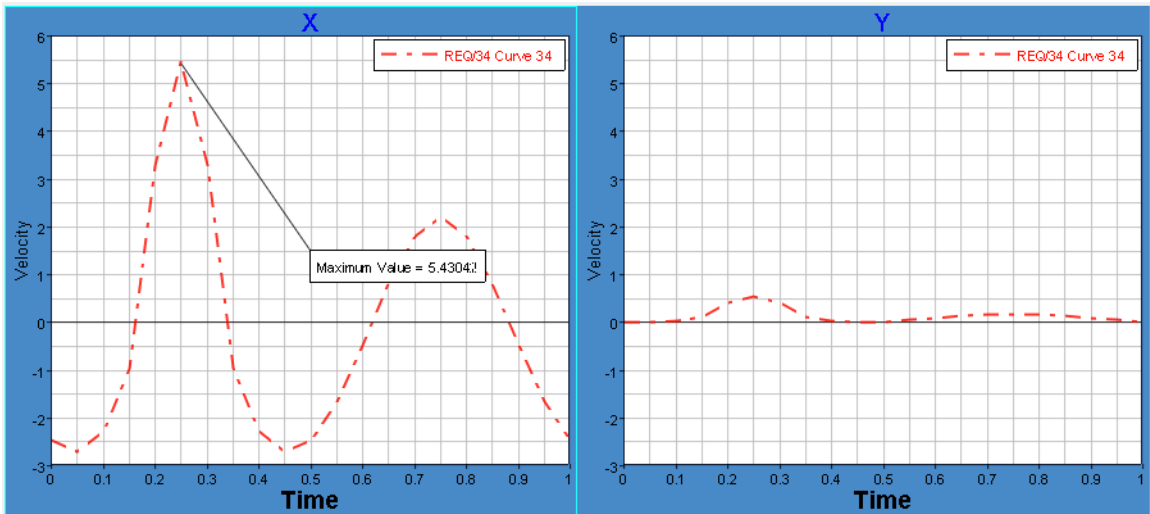
16. Right click in Window 1 and select **HG ApplyStyle...** to open the **Apply Style** window.
17. Again make sure the check boxes for **Plot**, **Header**, **Axes**, and **Curves** is selected.
18. Set **Apply to** to **All pages** and then click **OK**.

The settings from Window 1 are now applied to Page 2.




#### Step 4: Create a Note at Maximum of Each Curve.

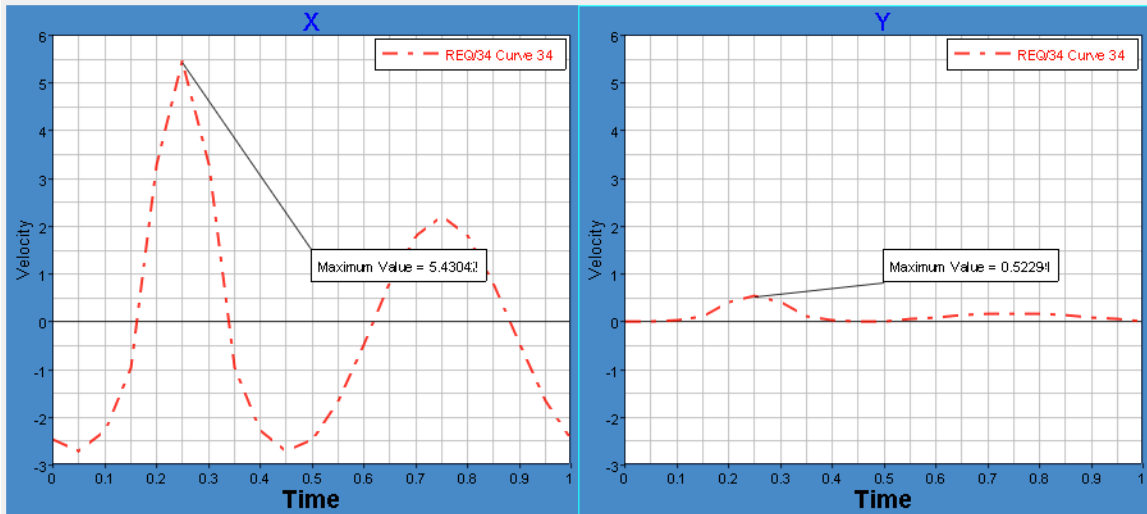
1. Enter the **Notes** panel by selecting  on the **Annotations** toolbar.
2. Click **Add** to create a new note.
3. Select the **Attach To** tab and select **Curve** for **Attach to**.
4. Under **Find point**, select  to attach to the maximum value of the curve.
5. Select the **Text** tab and enter the text `Maximum Value = .`
6. After entering the text, click the **{Y}** button to insert the Y value.
7. Press **Apply** to create the note.




8. Under the **Note list**, select **Copy** to copy Note 1.
9. Select Window 2 and in the **Notes** panel select **Paste**.

Notice how the note has been copied but it isn't attached at the maximum value of the curve. Instead it is attached at the same x point as the copied curve. In the next step the attachment point of the note will be updated.




10. Click on the **Attach To** tab and for **Find point**, select  to find the maximum value of the curve.



**Step 5: Use the Coordinate Info panel to investigate the curve.**

- Entering the **Coordinate Info** panel by selecting  on the **Curves** toolbar.
- Click in the Plot Window on a point on the curve and notice how the panel is updated with the Pt number, X value, and Y value:

Find point:	Curve:	REQ/34 Curve 34	Pt		X	Y	Show X as:
	Point:	18	14		0.7	0.130143	<input checked="" type="radio"/> Linear
	X:	0.9	15		0.75	0.136001	<input type="radio"/> dB10
	Y:	0.065514	16		0.8	0.130462	<input type="radio"/> dB20
Next Curve	Slope:	-0.802386	17		0.85	0.103935	Show Y as:
	Time:	0.9	18		0.9	0.065514	<input checked="" type="radio"/> Linear
			19		0.95	0.0236964	<input type="radio"/> dB10
			20		1	-0.00891068	<input type="radio"/> dB20

- Use the arrows to move from point to point .
- Use the Maximum and Minimum,  , to find the max and min of the curve.

**Step 6: Save the session (optional).**

- Save the session by selecting **File > Save As > Session**.
- Browse to a desired location and enter the name `Exercise_4a.mvw`.
- Click **Save** to save the file.