Assessment of how well students remember and use their calculus and physics in MET 470 Mechanical Vibrations Fall 2009.

| | 0 | 1 | 2 | 3 |
|---|---|---|---|---|
| Remember how to take derivatives of trig functions | Can't remember at all | Can only remember one (sine or cosine) | Remember fairly well but forgot negative cosine | Remember well, including d/dt of cos is negative sine |
| Can remember the chain rule | Doesn't remember chain rule at all | Uses chain rule some but doesn't seem to remember all the concepts | Uses chain rule but occasionally forgets to take derivative of function argument | Uses chain rule well |
| Meaning of derivatives | Doesn't remember what derivatives w/respect to time mean at all. | Not really sure of what derivatives mean | Knows one of the meaning of the derivatives | Knows $1^{st}$ derivative is velocity and $2^{nd}$ is acceleration |
| Meaning of words like Amplitude, displacement etc. | Can't match words with math results | Has some trouble matching words with math results. | Can read sentence and usually match word with math results | Can read a sentence and properly match word with mathematical result |

| Name | Can Take Derivatives | Chain Rule | Meaning of Derivatives | Vocabulary understanding |
|---|---|---|---|---|
| A | 3 | 3 | 3 | 3 |
| B | 3 | 3 | 3 | 1 |
| C | 3 | 3 | 3 | 1 |
| D | 3 | 3 | 3 | 1 |
| E | 3 | 3 | 3 | 1 |
| F | 3 | 3 | 3 | 0 |
| G | 3 | 3 | 3 | 1 |
| H | 3 | 3 | 3 | 1 |
| I | 3 | 3 | 2 | 2 |
| J | 3 | 3 | 3 | 1 |
| K | 3 | 3 | 3 | 1 |
| L | 3 | 3 | 3 | 0 |
| avg | 3 | 3 | 3 | 1 |

A few students did not realize that the first derivative (question 2) was the speed or velocity and almost everyone put down the magnitude of the acceleration for question 5 rather than the magnitude of the position. This may be due to the fact that in question 4 they were asked to derive the acceleration and did not realize question 5 was independent of 4. This appeared to be the case when we went over the quiz. In general they understand the concepts of derivatives.