Thursday Jan 15, hours 5-6: Draw a Figure

January-15-15 8:56 AM

Appeals policy

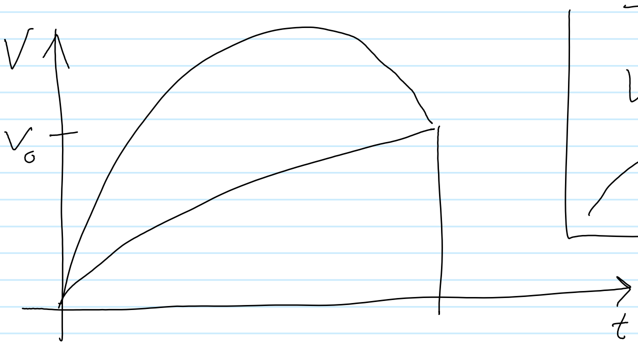
Then go over handout as follows:

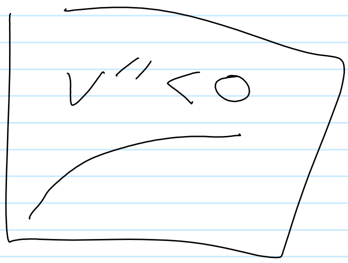
Reading: Section 1.2

Quiz 2:

Problems:

1.2.2. A particle moving on a straight line starts from rest and attains a velocity v_0 after traversing a distance s_0. If the motion is such that the acceleration was never increasing, find the maximum time for the transverse.





1.2.3. If a and b are positive integers with no common factor, show that

$$\left[\!\left[\frac{a}{b}\right]\!\right] + \left[\!\left[\frac{2a}{b}\right]\!\right] + \left[\!\left[\frac{3a}{b}\right]\!\right] + \cdots + \left[\!\left[\frac{(b-1)a}{b}\right]\!\right] = \frac{(a-1)(b-1)}{2}.$$

Cars in the Sahara desert.

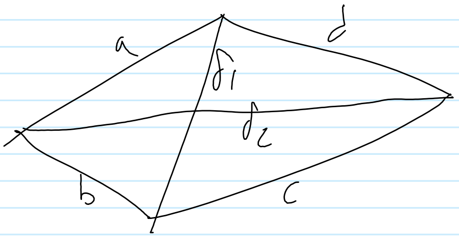
2.1.3. If V, E, and F are, respectively, the number of vertices, edges, and faces of a connected planar map, then

$$V - E + F = 2.$$

7.1.14. In a convex quadrilateral (the two diagonals are interior to the quadrilateral) prove that the sum lengths of the diagonals is less than the perimeter but greater than one-half the perimeter.

$$d_1 < \frac{a+b+c+d}{2}$$

$$d_1 + d_2 < a+b+c+d$$



$\delta_1 \leq \frac{\quad}{2}$

$\delta_1 + \delta_2 \leq a+b+c+d$

$2(\delta_1+\delta_2) \geq a+b+c+d.$

7.4.19. Use the concavity of $f(x) = \sqrt{x}$ to prove that if a, b, c are positive, then $a\cos^2\theta + b\sin^2\theta < c$ implies $\sqrt{a}\cos^2\theta + \sqrt{b}\sin^2\theta < \sqrt{c}$. (Hint: Sketch the graph of $f(x) = \sqrt{x}$. In the domain, where is the point $a\cos^2\theta + b\sin^2\theta$, and in the range, where is $\sqrt{a}\cos^2\theta + \sqrt{b}\sin^2\theta$?)