

**Mathematics 53: Elementary Analysis I**  
**Unit 5 Word Problems**

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1. A particle is moving on a line, where  $s$  feet is the directed distance of the particle from the origin,  $v$  feet per second is the velocity of the particle and  $a$  feet per second per second is the acceleration of the particle at  $t$  seconds. If  $a = e^t + e^{-t}$  and  $v = 1$  and  $s = 2$  when  $t = 0$ , find  $v$  and  $s$  in terms of  $t$ .
2. Find the volume of the solid of revolution generated of the region bounded by the curve  $y = 2^{-x}$  and the lines  $x = 1$  and  $x = 4$  is revolved about the  $x$ -axis.
3. A helicopter leaves the ground at a point 800 ft from an observer and rises vertically at 25 ft/s. Find the time rate of change of the measure of the observer's angle of elevation of the helicopter when the helicopter is 600 ft above the ground.
4. Find the value of  $x$  where  $h(x) = e^x + e^{4-x}$  attains its minimum value.
5. Compute for the arc length to the graph of  $y = \ln(\cos x)$  from  $[0, \frac{\pi}{4}]$ .

BONUS: Bakit letter  $e$  ang natural logarithm? Bakit hindi  $j$  or  $q$ ?

END OF EXERCISE

Total: 25 points

*“Math is a continuous search for patterns.”*  
*- Gian Louise A. Roy*

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