

## Quiz #2 Solutions

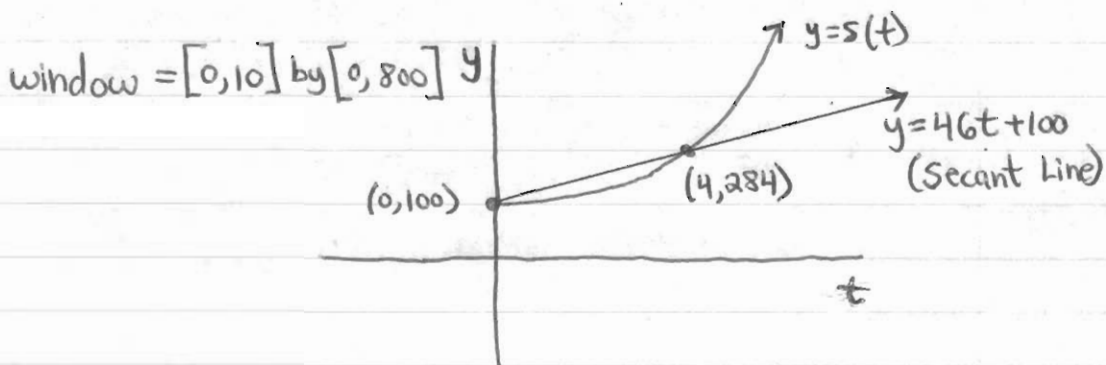
37)

|               |     |     |     |     |     |     |
|---------------|-----|-----|-----|-----|-----|-----|
| time (hr)     | 0   | 1   | 2   | 3   | 4   | 5   |
| distance (km) | 100 | 131 | 168 | 217 | 284 | 375 |

$$S(t) = t^3 + 30t + 100$$

38) average velocity between  $t=1$  and  $t=5$   $= \frac{S(5) - S(1)}{5 - 1} = \frac{375 - 131}{4} = 61 \frac{\text{km}}{\text{hr}}$

39) avg. velocity between  $t=0$  and  $t=4$   $= \frac{S(4) - S(0)}{4 - 0} = \frac{284 - 100}{4} = 46 \frac{\text{km}}{\text{hr}}$



40) The graph of the function  $y = S(t)$  appears to "straighten" out as you zoom in on the point  $(3, 217)$ .

$$41) \frac{S(3) - S(2.999)}{3 - 2.999} = 56.991001$$

$$\frac{S(3.001) - S(3)}{3.001 - 3} = 57.009001$$

The average of these two is  $57.000001$  which is the approximate velocity at  $t=3$ .

The "actual" or instantaneous velocity at  $t=3$  is  $57 \frac{\text{km}}{\text{hr}}$