Wednesday Example Solutions

Math 111

Example: The Chinese telecom company Huawei had a 10% share of global smartphone sales at the beginning of 2017 and six quarters later that had risen to 14.6%. Samsung's smartphone market share was 22.1% two quarters after the beginning of 2017, but that dropped to 21% three quarters later.

a) Model formulas for Huawei's and Samsung's market shares as *linear* functions of time (# of quarters after the beginning of 2017).

We have $H(t)$ and $S(t)$. For H, the slope is $\frac{14.6-10}{6-0} = .767$. For S, the slope is $\frac{21-22.1}{5-2} = -.367$. Therefore, we have $H - 10 = .767t$ and $S - 22.1 = -.367(t-2)$. Thus $H(t) = .767t + 10$ and $S(t) = -.367t + 21.367$.

b) One quarter after the beginning of 2017, Huawei's actual market share was 11%. Is this consistent with the other two Huawei data points provided?

The line predicts we would have $H(1) = .767 + 10 = 10.767$. Therefore, $(1, 11)$ is not consistent with the other points.

c) On what interval(s) is our model of Huawei's market share increasing? Decreasing? What about Samsung's market share? Assume that we use the functions' mathematical domain in each case.

$H(t)$ is increasing on $(-\infty, \infty)$, and $S(t)$ is decreasing on $(-\infty, \infty)$.

d) When do the models predict smartphone market share for Huawei will surpass Samsung?

This is when $H(t) = S(t)$, so $.767t + 10 = -.367t + 21.367$. Thus $1.134t = 11.367$, so $t = 10.02$: roughly 10 quarters after the start of 2017, or in the middle of 2019 (it was actually 17.6 vs 22.7).