PS4: Interpreting, using, estimating derivatives and second derivatives - Answer key qr

1. (1.5.5.7)

   (a) If a patient takes a dose of 50 mL of a drug, their body temperature will go up by like 0.75 degrees F.

   (b) deg F per mL

   (c) At a dosage of 50 mL, if the patient takes *one more* mL, they'll experience 0.02 degrees F *less* of temperature change.

2. (1.5.5.9)

   (a) $AV_{[40000,55000]} \approx -0.153$ dollars per mile.

   (b) $h'(55000) \approx -0.147$ dollars per mile.
   If the car has been driven 55000 miles, for each additional mile driven, we expect its value to drop by like 15 cents.

   (c) Probably $h'(30000) < h'(80000)$ (but $|h'(30000)| > |h'(80000)|$).
   Negative numbers are annoying.

   (d) $h(t)$ is always decreasing and always c.u. and probably tends to zero.
   $h'(t)$ is always negative and probably also tends to zero. (therefore it is c.d.)

3. (1.6.6.12)

   (a) $h'(4.5) \approx 14.3$
   $h'(5) \approx 21.2$
   $h'(5.5) \approx \mathbf{23.9}$

   (b) $h'(5) \approx 9.6$

   (c) acceleration; (feet per second) per second

   (d) $0 < t < 2$, and then $6 < t < 10$.