Quiz 12 Key — MA161 — October 12, 2018

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Min	Mean	Max
1	10	20

1. (10 points) If the half-life of a radioactive substance is 7 days, how long (in days) does it take for a sample to **lose** two-thirds of its original amount?

   [*HINT:* the original amount does not matter for this problem because it cancels out. You can assume it is 1 gram.]

   $7\ln(3)/\ln(2)$
   NOTE: this problem appeared on the second midterm in the fall of 2017.

2. (10 points) Solve $\sinh x = 1$ for x.

   [*HINT:* first solve for e^x, then take the log. Remember that $e^{-x} = \frac{1}{e^x}$. There is only one solution, because you can't take the log of a negative number.]

   $\ln\left(1+\sqrt{2}\right)$
   NOTE: this problem appeared on the second midterm in the fall of 2017.