Classwork - The Tortoise and the Hare

① a. Tortoise $D = 40$, $r = 4$, $t = ?$

$D = rt$

$40 = 4t$

$t = 10$ 10 hrs for the tortoise

Hare $D = 40$, $r = 10$, $t = ?$

$D = rt$

$40 = 10t$

$t = 4$ 4 + 5 hr nap = 9 hrs for the hare, so he won!

This is one way to solve.. there are others...

b. T & D are the same if there is a tie

So:

if Tortoise ⇒ $D = 4t_t$ ← tortoise time and $t_t = \frac{D}{4}$

if Hare ⇒ $D = 10t_h$ ← hare time $t_h = \frac{D}{10} + 5$

↑ same time

Solve for D: $\frac{D}{4} = \frac{D}{10} + 5$

$20\left(\frac{D}{4} = \frac{D}{10} + 5\right)$

$5D = 2D + 100$

$3D = 100$

$D = \frac{100}{3}$ → $33\frac{1}{3}$ MI LONG RACE FOR A TIE!

Problem Set

#1. a. $V = 10{,}000\,(1 - .03)^{y}$

$V = 10{,}000\,(.97)^{y}$

b. $V = 10{,}000\,(.97)^{5} = 8587.34$ $8,587.34

c. One possibility: Take her money out and invest it in another company.

Another: Wait out the downward trend, because experts say it will come back up again.

#2.

# of days	level of med
0	16
2	8
4	4
6	2
8	1
10	.5

(each step: $\times \frac{1}{2}$)

b. $M = 16\,(.5)^{\frac{n}{2}}$ — M: medicine; 16: starting amt; .5: decay factor; n: # of days; 2: half life length (in days)

c. $M = 16\,(.5)^{\frac{20}{2}}$

$M = 16\,(.5)^{10}$

$M = 0.015625$

0.015625 mCi left in patient's body after 20 days.