Challenge #12

Hawking has 80 lbs of precious pebbles (calculus) and is giving away 10% of what is left each week.

Turing has 20 lbs of precious pebbles and is adding 10% of what is there each week.

When will each reach their goal of 40 lbs of pebbles? What is the approximate halving/doubling time respectively?

Hawking: $T_{half} \approx \dfrac{70}{P} = \dfrac{70}{10} = 7$ weeks

Turing: $T_{double} \approx \dfrac{70}{P} = \dfrac{70}{10} = 7$ weeks

# weeks	what's left Hawking pebbles	amt in his pile Turing pebbles
0	80	20
1	$80(0.9) = 72$	$20(1.1) = 22$
2	$80(0.9)^2 = 64.8$	$20(1.1)^2 = 24.2$
3	$80(0.9)^3 \simeq 58$	$20(1.1)^3 = 26.6$
4	$80(0.9)^4 \simeq 52$	$20(1.1)^4 \simeq 29$
5	$80(0.9)^5 \simeq 47$	$20(1.1)^5 \simeq 32$
6	$80(0.9)^6 \simeq 43$	$20(1.1)^6 \simeq 35$
7	$80(0.9)^7 \simeq 38$	$20(1.1)^7 \simeq 39$
8	$80(0.9)^8 \simeq 34$	$20(1.1)^8 \simeq 43$

$\Rightarrow$ it takes a little more than 7 wks for Turing's pile of pebbles to double and a little less than 7 wks for Hawking's pile of pebbles to be cut in half.

lbs

Hawking

Turing

weeks