Quiz 11

February 26, 2016

1. Compute $\sum_{n=1}^{\infty} 10\frac{-e^{n+1}}{4^{3n}}$. Round to 4 decimal places.

$= \sum_{n=1}^{\infty} -10\ \frac{e^n e}{(4^3)^n}$

$= \sum_{n=1}^{\infty} -10e\left(\frac{e}{64}\right)^n$

$\left(a = -10e\left(\frac{e}{64}\right),\ r = \frac{e}{64} \right.$

$= -10e\left(\frac{e}{64}\right)\left(\frac{1}{1-e/64}\right)$

$\approx \boxed{-1.2058}$

$\sum_{n=1}^{\infty} 10\ \frac{(-e)^{n+1}}{4^{3n}}$

$= \sum_{n=1}^{\infty} 10\ \frac{(-e)^n(-e)}{(4^3)^n}$

$= \sum_{n=1}^{\infty} -10e\ \left(\frac{-e}{64}\right)^n$

$\left(a = -10e\left(\frac{-e}{64}\right),\ r = \frac{-e}{64} \right.$

$= -10e\left(\frac{-e}{64}\right)\left(\frac{1}{1-(-e/64)}\right)$

$\approx \boxed{1.1075}$

2. ***Set up, but do not evaluate*** a series which tells you how much you should invest today so that starting in 20 years, you can make annual withdrawals of \$1,000 in perpetuity, assuming an annual interest rate of 2% compounded continuously. (No work required)

$A = Pe^{rt}$, so $P = Ae^{-rt}$

years from today	P
20	$1000e^{-.02(20)}$
21	$1000e^{-.02(21)}$
22	$1000e^{-.02(22)}$
⋮	⋮

$\boxed{\sum_{n=20}^{\infty} 1000e^{-.02n}}$