Problem 8-1

Goal: Determine return under various interest scenarios

Given:

	Time Zero investment	$10,000	
	interest rate	6.0%	
a.)	compounding	12	monthly
	? return after	10	years
b.)	compounding	2	semi-annual
	? Time for return to double	$20,000	
c.)	compounding	-	continuous
	? Time for return to double	$20,000	

Approach: Calculate future value using compound interest equation: F = P * (1+i/m)^(m*N)

b.) & c.) require solving for N, trail & error using "solver" OR take logarithms & solve explicitly for N

taking log's ln F/P = m*N * ln[(1+i/m)]

N = [(ln F/P) /m] / ln[(1+i/m)]

c.) continuous compounding F = P e^rN take logarithms & solve explicitly for N

N = (ln F/P) / r

Calculations:

a.) monthly compounding $18,193.97 = $10,000 * (1+0.06/12)^(12*10)

Answer a.) **$18,194**

b.) semi-annual compounding time to double 11.72489 = (LN($20,000/$10,000))/(LN((1+0.06/2)))/2

Answer b.) **11.725** years check = $20,000.13

c.) continuous compounding time to double 11.55245 = (LN($20,000/$10,000))/0.06

Answer c.) **11.552** years check = $19,999.46

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