The future value of an investment with regular deposits or payments is the sum of all the payments or deposits plus the accumulated interest. To determine the future value of an investment with n equal regular payments of R dollars, add the future values of all of the regular payments:

$$A = R(1 + i)^0 + R(1 + i)^1 + R(1 + i)^2 + R(1 + i)^3 + \ldots + R(1 + i)^{n-1}$$

You can solve problems about the future value of an investment with regular payments using spreadsheet software or the financial application on a graphing calculator. The future value of a single deposit is greater than the future value for a series of regular payments of the same total amount.

Example 1: Sophia deposits $750 into her savings account at the end of each 3-month period. The account earns 2.8% interest, compounded quarterly.

a) How much money will be in the account at the end of 3 years? How much of this money will be earned interest?

N = 12 PMT = 750
I% = 2.8 FV = 0 ← Alpha Enter −9354.71
PV = 0 P/Y = 4 payments per year
present value C/Y = 4 End Begin

b) Sophia needs at least $6500 for a trip to China. Will she have enough after 2 years?

N = 8 FV: → −6149.08 no
I% = 2.8 P/Y = 4
PV = 0 C/Y = 4
PMT = 750 End Begin

Example 2: Michael is saving up to buy a combination washer and dryer in 2 years. He plans to deposit the same amount at the end of each month into an account that pays 1.9%, compounded annually. What regular payments much Michael make at the end of each month to meet his goal of $1300? ~~What interest will he earn~~?

N = 24 PMT: → 53.20
I% = 1.9 P/Y = 12
PV = 0 C/Y = 1
FV = 1300 End Begin

Example 3: What interest rate, compounded daily, is required to make daily payments of $1 grow to $1200 in 3 years?