Compound Interest

Learning Goal

How will the approach to solving need to change?

Consider these scenarios. Consider how the approach to solving will need to change.

Scenario 1:

E.g., Challis recently started a part-time job in order to build up her savings account. Her most recent paycheck, $400, will be deposited into an account that earns 3.6% per year, compounded annually.

Problem: How much will Challis have saved at the end of two years?

Scenario 2:

E.g., Challis recently started a part-time job in order to build up her savings account. Her most recent paycheck, $400, will be deposited into an account that earns 3.6% per year, compounded monthly.

Problem: How much will Challis have saved at the end of two years?

Scenario 1:

$A = P(1+i)^n$

$= 400(1+0.036)^2$

$= 400[(1.036)^2]$

$= 429.32$

Scenario 2:

$A = P(1+i)^n$

$= 400\left[\left(1+\frac{0.036}{12}\right)^{2\times 12}\right]$

$= 429.82$

Calculating Growth Factors & Compounding Periods

Assume # of yrs = 4

Annual Interest Rate	Compounding Frequency	Growth Factor per Compounding Period, *i*	Number of Compounding Periods, *n*
3.5%	Annual	0.035	$1\times 4 = 4$
6%	Semi-annual	$\frac{0.06}{2} = 0.03$	$2\times 4 = 8$
2.8%	Quarterly	$\frac{0.028}{4} = 0.07$	$4\times 4 = 16$
19.9%	Monthly	$\frac{0.199}{12}$	$4\times 12 = 48$

NB: Semi-annual = twice per year; quarterly = four times per year; monthly = 12 times per year

Practice Problems

a) $2000 is invested at 3% per year, compounded semi-annually, for two years

b) $15 000 is invested at 4.8% per year, compounded monthly, for four years.

c) How much **interest** was earned by each investment?

Follow-up Practice:

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