Financial Calculations for the Financial Planner™
Sample Question

1. Mario wants to accumulate the capital to provide for university tuition for 4 years his son, Anthony. Mario expects Anthony's tuition to be $5,200 in the first year increasing at 11% per year. Anthony's tuition will be paid at the start of each year. Mario expects to earn 8% and to have a marginal tax rate of 42%.

   How much does Mario need to accumulate?

   (A) $21,906.32
   (B) $22,774.34
   (C) $23,509.16
   (D) $24,306.11

   (Concepts) This is a problem of solving for the net present value of an indexed annuity due. It can be solved as a time value of money problem or a cash flow problem.

   As a time value of money problem, the keystrokes are:

gold, CLEAR ALL	Clear all entries
gold, DISP, 2	Set the number of decimal places to 2
1, gold, P/YR	Enter 1 as the payments per year
4, gold, ×P/YR	Enter 4 as the number of years
8, ×, gold, (, 1, -, .42, gold,), -, 11, ÷, 1.11, I/YR	Enter the interest rate as (((8% × (1 - 42%)) - 11%) ÷ (1 + 11%))
5200, +/-, PMT	Enter -$5,200 as the payment
0, FV	Enter $0 as the future payment
gold, BEGIN	Set the calculator for an annuity due
PV	Solve for the present value of $22,774.34, the target capital amount.

   As a time value of money problem, the shorthand solution is $22,774.34, calculated by entering DISP = 2, P/YR = 1, ×P/YR = 4, I/YR = (((8% × (1 - 42%)) - 11%) ÷ (1 + 11%)), PMT = -$5,200, FV = $0, MODE = BEGIN and solving for PV. So, Mario needs to accumulate $22,774.34.

   Answer is (B). Mario needs to accumulate $22,774.34.

As a cash flow problem, the keystrokes are:

gold, CLEAR ALL	Clear all entries
gold, DISP, 2	Set the number of decimal places to 2
1, gold, P/YR	Enter 1 as the payments per year
5200, +/-, CFj	Enter -$5,200 as CF0
×, 1.11, ->M, =, CFj	Enter 1.11 in memory and (-$5,200 × 111%) as CF1
×, RM, =, CFj	Enter ((-$5,200 × 111%) × 111%) as CF2
×, RM, =, CFj	Enter (((-$5,200 × 111%) × 111%) × 111%) as CF3
8, ×, gold, (, 1, -, .42, =, I/YR	Enter (8% × (1 - 42%)) as the interest rate
gold, NPV	Solve for -$22,774.34, the target capital amount

As a cash flow problem, the shorthand solution is -$22,774.34, calculated by entering DISP = 2, P/YR = 1, CF0 = -$5,200, CF1= (CF0 × 111%), CF2 = (CF1 × 111%), CF3 = (CF2 × 111%), I/YR = (8% × (1 - 42%)), and solving for NPV.

Answer is (B). Mario needs to accumulate $22,774.34.

(Keywords: education, capital required, cash flow, net present value, indexed annuity due)

