

MA 110 SECTION 3.2 COMPOUND INTEREST

HOMEWORK: 1, 3, 5, 7, 23, 25, 35, 37, 49, 61, 63
(After we cover section 3.3 also do: 53, 59, 75)

Interest paid on reinvested interest is compound interest.

THE COMPOUND INTEREST FORMULA:

Follow this scenario to derive the formula.

A \$1000 is invested in an account earning 8% compounded quarterly.

1. How much money is in the account after one quarter?

$$A = P(1 + rt) = 1000(1 + .08(1/4)) = 1000(1.02) = \$1020$$

2. How much money is in the account after two quarters?

The new "principle" is now \$1020 which is $1000(1.02)$.

$$A = (1000)(1.02)(1 + .08(1/4)) = (1000)(1.02)(1.02) = 1000(1.02)^2 = \$1040.40$$

3. How much money is in the account after three quarters?

The new "principle" is now \$1040.40 which is $1000(1.02)^2$.

$$A = (1000)(1.02)^2(1 + .08(1/4)) = (1000)(1.02)^2(1.02) = 1000(1.02)^3 = \$1061.21$$

4. How much money is in the account after four quarters?

The new "principle" is now \$1061.21 which is $1000(1.02)^3$.

$$A = (1000)(1.02)^3(1 + .08(1/4)) = (1000)(1.02)^3(1.02) = 1000(1.02)^4 = \$1082.43$$

Observing the pattern, the amount of an investment after n interest periods is given by

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

P = initial deposit or principle

i = annual rate/# of interest periods per year

n = # of interest period for which the principle is invested

A = Amount in the account after n interest periods

