INTEREST 2

Compound Interest: $A = P(1+\frac{r}{100})^n$ where

A = final amount.
P = Principal.
r = rate per interest period (usually a year),
n = number of interest periods.

Compound interest is where you earn interest on your interest.

Example: What will be the value of $5000 invested for 10 years at 5% p.a. compound interest?

$A = P(1+\frac{r}{100})^n$ $= 5000(1 + 5/100)^{10} = 5000(1.05)^{10} = \$8144.47$

Exercises:

Q.1. If I invest $200 at a compound interest rate of 8% p.a., how much will I have in the account after 10 years?

Q.2. Josh invested $100 in a bank account that paid 5% p.a. compound interest. How much would it be worth after 4 years?

Q.3. Chris invested $10 000 for 20 years at 6% p.a. compound interest. What was the final value of the account?

Q.4. Karen invested $10 000 for 20 years in an account where the 6% p.a. interest was compounded every 6 months. What was the final value of the account?

Q.5. Michelle invested $10 000 for 20 years in an account where the 6% p.a. interest was compounded every month. What was the final value of the account?

The compound interest formula can also be used to determine depreciation. In this case the rate is subtracted.

Depreciation: $A = P(1 - r/100)^n$ where

A = final value,
P = Initial cost,
r = rate per depreciation period (usually a year),
n = number of depreciation periods.

Example: A photocopier costs $4 000 and depreciates at the rate of 20% per year. How much is it worth after 5 years?

$A = P(1 - r/100)^n$ $4000(1 - 20/100)^5$ $= 4000(0.8)^5$ $= \$1310.72$

Exercises.

Q.1. Simone bought a walkman for $120. If it depreciates at the rate of 15% per year, how much is it worth after 3 years.

Q.2. Emma bought a car for $8000. If it depreciates at the rate of 12% per year, how much will it be worth after 10 years.

Q.3. Lauren bought a sound system for $3 800. If it depreciates at the rate of 1% per month, how much will it be worth after 2 years?

Answers:

Compound Interest: Q.1. = $431.78 Q.2. = $121.55 Q.3. = $32071.35 Q.4. = $3260.38 Q.5. = $33102.04

Depreciation: Q.1. = $73.70 Q.2. = $2228.01 Q.3. = $2985.58