Effective rate of interest over multiple time units

Example 1: How much will you get if you invest £1200 for 3.75 years at an effective rate of interest of 3% per year.

Example 2: How much will you get if you invest £4500 for 4 months, at an effective interest rate of 2.5% every 6 months.

Example 3: How much will you get if you invest £1800 for 11 weeks, at an effective interest rate of 3.4% every year.

1. How much will you get back if you invest £800 for 2.75 years
   effective rate of interest of 2% per ye

2. How much will you get back if you invest £2300 for 3 years at an ef
   rate of interest of 4% every 6 mont

3. How much will you get back if you invest £5200 for 11 months at an e
   rate of interest of 3.5% per ye

4. How much will you get if you invest £1450 for 29 weeks at an effective i
   rate of 1.7% per yea

5. How much will you get if you invest £4050 for 3 months at an effective i
   rate of 5.2% every 4 month

Calculating effective interest rates between time units.

If you want to convert an effective interest rate from 1 amount of time to another, you must use the following formula. (WORKS FOR AER)

$$j = (1 + i)^{\frac{y}{x}} - 1$$

i stands for the original effective interest rate for x years
j is the effective interest rate you are converting into for y years.

Example 1: What is the effective interest rate every 6 months equivalent to an interest rate of 10% per year?

Example 2: What is the effective interest rate every month is equivalent to an interest rate of 4.5% per year?

Example 3: (AER) What is the effective rate of interest per year equivalent to 0.5% per month.

Example 4: What is the effective rate of interest per 4 months, equivalent to 3.5% every 3 months.

Try these yourself

i = 9.2% x = 12 y =
x = 1 y = 0.5

1. What is the effective interest rate every 6 months equivalent to an interest rate of 9.2% per year?
2. What is the effective interest rate per year equivalent to 2.5% every 2 months?
3. What is the effective interest rate every 6 months equivalent to 4.5% every 4 months?
4. What is the effective interest rate every year equivalent to 1.3% every month?
5. What is the effective interest rate every week, equivalent to 3.6% every year?

Finding the initial amount

$$D = \frac{F}{(1 + i)^t}$$

Deposit – D
Final amount – F
interest – i
time – t

Example 1: Say we need £1000 in one years time. The effective rate of interest in our bank account is 5% per year. How much money do we need to Deposit into our account originally to meet this target?

Example 2: If you want to save up £18,000 in 4 years and you have an interest rate of 3.4%. How much will you need to deposit originally?

Example 3: If you want to save up £12,000 in 10 years and you have an interest rate of 0.5% per month. How much would you need to originally deposit?

1. If you want to save £3000 in 2 years and you have an interest rate of 3.5%. How much would you need to deposit?
2. If you want to save £9800 in 6 years and you have an interest rate of 9%. How much would you need to deposit?
3. The Smiths are saving up £40,000 for a deposit on a house. They want to make it in 8 years time and have an annual effective interest rate of 7.5%. How much would they need to deposit?
4. Miss Anderson is saving up £100,000 to start a business. She gets an effective monthly interest rate of 0.3%. She is going to save for the next 15 years. How much should she deposit if she is going to reach her goal?