

## Investment Problems

The main thing to remember for investment problems is the formula,  $I = Prt$

Where  $I$  = interest

$P$  = principal or amount invested or borrowed

$r$  = interest rate

$t$  = time in years

In the problems seen in a typical Elementary Algebra course, the time  $t$  is usually 1. Also, there are generally two investments being made, so you will need to use the formula more than once.

### **Example**

An investment counselor invested 75% of a client's money into a 9% annual simple interest money market fund. The remainder was invested in 6% annual simple interest government securities. Find the amount invested in each if the total annual interest earned is \$3300

### **Solution:**

The total amount invested is the unknown .... So call it  $x$ .

Consider first the money market fund. Since 75% of the money was invested in the money market fund, the principal was  $0.75x$ . Since the simple interest on this account is 9%, the rate on this fund is 0.09. This means the interest earned on the money market fund was  $(0.75x)(0.09)(1)$

Now, consider the government securities. Since 75% of the money was invested in the money market and the remainder was invested in government securities that means that 25% of the money was invested in government securities. Thus,  $0.25x$  is the principal that was invested in government securities. The simple interest earned on this account was 6%, making the interest rate equal to 0.06. Thus, the interest earned on the government securities was  $(0.25x)(0.06)(1)$

Now, consider the TOTAL interest earned:

The interest earned on the money market fund plus the interest earned on the government securities is the total interest earned. So get the equation:

$$(0.75x)(0.09)(1) + (0.25x)(0.06)(1) = 3300$$

$$0.0675x + 0.015x = 3300$$

$$0.0825x = 3300$$

$$x = 40,000$$

Since  $x$  represents the total investment, the total investment was \$40,000. Since 75% was invested in the money market,  $(0.75)(40,000) = 30,000$

The remainder 25% was invested in government bonds,  $(0.25)(40,000) = 10,000$

So, \$30,000 was put in the money market and \$10,000 was put in government bonds.

- 1) A total of \$6,000 is deposited in two simple interest accounts. On one account the annual simple interest rate is 7.5%; on the second account the annual simple interest rate is 11.4%. How much should be invested in the 11.4% interest account so that the total interest earned is \$528
- a) \$5,000      b) \$2,000      c) \$3,000      d) \$4,000
- 2) An investment of \$4400 is made into a 10.5% annual simple interest account. How much money is deposited into an 8% annual simple interest account if the total interest earned on both accounts is 9% of the total investment?
- a) \$7,000      b) \$6,600      c) \$5,600      d) \$6,000
- 3) A total of \$8,000 is invested into two simple interest accounts. On one account the annual simple interest rate is 9% ; on the second account the annual simple interest rate is 7%. How much should be invested in the 7% account so that the total interest earned is 8.5% of the total investment?
- a) \$5,400      b) \$2,000      c) \$6,000      d) \$1,600
- 4) An investment of \$2,500 is made at an annual simple interest rate of 11.4%. How much money is invested at an annual simple interest rate of 9.5% if both accounts earn the same interest?
- a) \$2,000      b) \$3,000      c) \$3,500      d) \$3,250
- 5) A stockbroker's client has \$50,000 to invest. The broker recommends that part of the \$50,000 be placed in 6% tax-free municipal bonds and the remainder in 9.5% commercial bonds. How much should be invested in the commercial bonds so that the total interest earned is \$3700?
- a) \$35,000      b) \$20,000      c) \$30,000      d) \$25,000
- 6) A total of \$18,000 is deposited into two simple interest accounts. On one account the annual simple interest rate is 8%; on the second account the annual simple interest rate is 10%. How much should be invested in the 10% account so that both accounts earn the same interest?
- a) \$10,000      b) \$8,000      c) \$9,000      d) \$12,000