

# Exercise AP-101

Present value of a single payment

The Economic Skills Project

## 1 Problem

### Problem

What is the present value of \$50,000 in year 10 when the interest rate is 15%? Round to the nearest dollar.

## 2 Answer

### Answer

Here's the solution:

- \$12,359

## 3 Method

### Solution method

Here's one approach:

1. Apply the fundamental present value formula.
2. Check that it works.

## 4 Solution

### 4.1 Step 1

#### Applying the formula

The present value formula from above is:

$$X = \frac{F_t}{(1+r)^t}$$

Putting in  $F_T = \$50,000$ ,  $r = 0.15$ , and  $T = 10$  gives:

$$X = \frac{\$50,000}{(1.15)^{10}} = \$12,359$$

### 4.2 Step 2

#### Checking that it works

If the calculation is correct, \$12,359 should grow to \$50,000 over 10 years. Using the relationship from the first page to check:

$$X(1+r)^T = \$12,359 \cdot 1.15^{10} = \$49,999$$

That passes the check. The \$1 difference is due to rounding the present value to the nearest dollar. The precise present value is actually about \$12,359.24.

Done!