Exercise AP-221

Present value of a finite stream

The Economic Skills Project

1 Problem

Problem

What is the present value in year 0 of a stream of $2500 payments starting in year 1 and ending in year 20 when the interest rate is 5%?

2 Answer

Answer

Here's the solution:

- $31,156

3 Method

Solution method

Here's one approach:

1. Draw the cash flow diagram.
2. Use the finite stream formula.

4 Solution

4.1 Step 1

Draw the cash flow diagram

Here's how it looks:

4.2 Step 2

Use the finite stream formula

The present value of an finite stream of identical payments F starting at time 1 and ending at T when the interest rate is r is given by:

- $\text{PV} = \frac{F}{r}\left(1 - \frac{1}{(1+r)^T}\right)$

Filling in the other numbers and calculating gives:

- $\text{PV} = \frac{\$2500}{0.05}\left(1 - \frac{1}{1.05^{20}}\right) = \$31,156$

Done!