

The **Sinking Fund Method (SFM)** integrates the time value of money into value reduction models. Rather than assuming an asset degrades in a flat linear fashion, SFM conceptualizes a scenario where a constant annual fund deposit (d) is placed into an imaginary account earning interest at a given rate (i). Because this fund accumulates interest exponentially, the total accumulated depreciation (D_n) grows slowly in the early years and accelerates later. Consequently, the asset's remaining book value (C_n) drops more slowly in the initial half of its useful lifespan compared to the Straight Line Method.

First, we solve for the uniform annual sinking fund deposit (d) required to accumulate the full asset depreciation over the entire 10-year horizon ($L=10$, $i=0.10$):

$$d = (C_o - C_n) \frac{i}{(1+i)^n - 1} = (\text{P}220,000 - \text{P}30,000) \frac{0.10}{(1+0.10)^{10} - 1}$$

$$d = \text{P}11,921.625$$

Now, calculate the accumulated depreciation at Year 5 (D_5) by shifting this annual deposit into a 5-year future-worth annuity expression ($n=5$):

$$D_5 = C_o - C_n = \frac{d}{i} [(1+i)^n - 1]$$

$$D_5 = \frac{\text{P}11,921.625}{0.10} [(1 + 0.10)^5 - 1] = \text{P}72,782.71$$

Finally, evaluate the remaining book value at Year 5 (C_5):

$$C_5 = C_o - D_5 = \text{P}220,000 - \text{P}72,782.71$$

$$\mathbf{C_5 = \text{P}147,217.29}$$