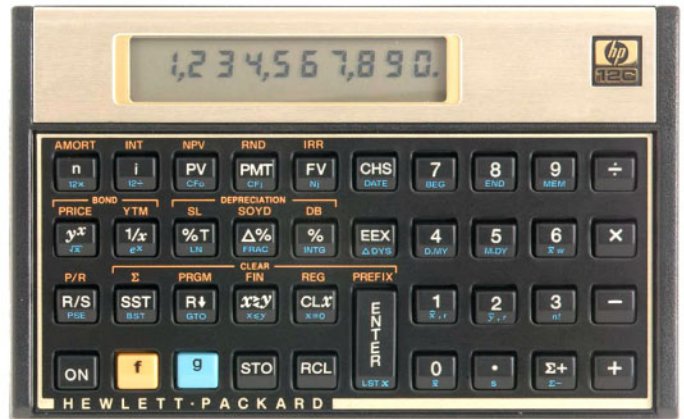**hp calculators**

HP 12C Depreciation

Depreciation

Depreciation on the HP12C

Practice solving depreciation problems

Practice solving partial-year depreciation problems

Additional information

Depreciation

Depreciation (Latin 'Depretium': 'decline in price' or 'value') is an accounting term that may be defined as the permanent and continuing diminution in the quality, quantity or the value of an asset over time. This is due to many reasons, from deterioration and obsolescence to impending retirement. It applies particularly to physical assets like equipment and structures. In industry, for accounting purposes, depreciation is also a method of deducting the cost of business property related to capital assets as they wear out, lose value, or become obsolete in order to recover their cost as a business expense. A capital asset can be a piece of equipment, a building or a vehicle expected to be used for several years. The purchase price of the asset on the purchase date is called **book value**.

Depreciation on the HP12C

There are mathematical tools that calculate the depreciation of assets, and the HP12C has functions that allow three different approaches: straight-line depreciation ([SL]), depreciation using declining balance ([DB]) and depreciation using sum of the years digits ([SOYD]). These functions can be used to directly calculate depreciation or as part of a program or more complex calculations. The expressions used by the HP12C to calculate depreciation with these functions are:

Straight Line	Declining Balance	Sum Of the Years Digits
$DPN_J = \dfrac{SBV - SAL}{L} \mid j = 1,2,\cdots,L$	$DPN_J = RBV_{J-1}\dfrac{FACT}{100L} \mid j = 1,2,\cdots,L$	$SOYD_K = \dfrac{(W+1)(W+2F)}{2}$

Figure 1

where:
L = asset's useful life expectancy;
SBV = starting book value;
SAL = salvage value;
$FACT$ = declining balance factor expressed as a percentage;
j = period number;
DPN_j = depreciation expense during period j;
RDV_i = remaining depreciable value at the end of period j; $RDV_j = RDV_{j-1} - DPN_j$
where $RDV_0 = SBV - SAL$

RBV_i = remaining book value; $RBV_j = RBV_{j-1} - DPN_j$ where $RBV_0 = SBV$

Y_1 = number of months in the partial first year;

The HP12C calculates depreciation with either of these three methods by using TVM registers [n], [i], [PV] and [FV] to hold the necessary data, as shown below:

Register	Contents
[FV]	salvage value of the asset
[PV]	original cost of the asset
[n]	expected useful life of the asset (years)
[i]	declining-balance factor ([DB] only)

To calculate the depreciation after entering these values, key in the number of the year for which the depreciation is to be calculated and press [f][SL], [f][SOYD] or [f][DB]. The amount of depreciation is calculated and shown in the display. To see the remaining depreciable value (book value minus salvage value) press [x≷y].

Practice solving depreciation problems

Example 1: The R&D department of a crystal refinement company spent $28,000 for new equipment for the digital spectrometer lab. The expected life for this equipment is 12 years, and the salvage value is $2,500. Calculate the declining balance depreciation for the fifth and eighth years and compare the values to the straight-line fixed depreciation. Use the DB method with a 2× weight (200%) related to the SL.

Solution: Load the TVM registers with the relevant values and calculate the depreciation for the fifth and eighth years using the DB method:

[2][8][0][0][0] [PV] [2][5][0][0] [FV] [2][0][0] [i] [1][2] [n] [5] [f][DB]

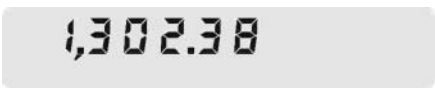$$2,250.52$$

Figure 2

[8] [f][DB]

$$1,302.38$$

Figure 3

Keep the TVM registers with previous values and calculate the depreciation using the SL method. As the straight-line method returns the same depreciation amount for each valid period, it is enough to calculate it for the first year.

[1] [f][SL]

$$2,125.00$$

Figure 4

Answer: The amount of depreciation with 2× weighted DB method for the 5th year is $2,250.52 and $1,302.38 for the 8th year. With the same figures, the annual amount of depreciation calculated with the SL method is $2,125.

Example 2: Professional video equipment bought for $15,000 has a useful life of 8 years with a salvage value of $1,100. Using the SOYD method, find the amount of depreciation for the fourth year.

Solution: Load the TVM registers with the relevant values and calculate the SOYD depreciation for the fourth year:

<div align="center">

1 5 0 0 0 [PV] 8 [n] 1 1 0 0 [FV] 4 [f] [SOYD]

</div>

<div align="center">

1,930.56

</div>

<div align="right">Figure 5</div>

Answer: The amount of depreciation for the fourth year is $1,930.56.

Practice solving partial-year depreciation problems

In most cases, the acquisition date of an asset does not coincide with the start of the fiscal or tax year. In these cases, the amounts of the first and last year's depreciation are computed as fractions of a full year's depreciation. Consider the example shown in Figure 6.
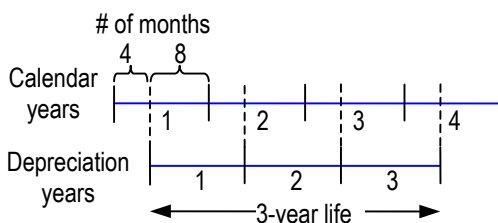

<div align="right">Figure 6</div>

When using the straight-line method, calculating partial-year depreciation is a matter of calculating depreciation fractions related to the calendar year, because the amount of depreciation for each depreciation year is constant. In the diagram shown in Figure 3, the amount of depreciation calculated with SL for the first calendar year is 2/3 of the amount of depreciation for a full year, and for the fourth calendar year it is just 1/3 of it.

When using either DB or SOYD depreciation method, the depreciation fractions are the ones reflected by the fractions of the depreciation years. The relationship between the calendar year and the depreciation year in the example shown in Figure 6 for DB and SOYD depreciation methods is shown in the table below:

Calendar year	Depreciation year
1 (May-Dec)	2/3 × year 1
2	(1/3 × year 1) + (2/3 × year 2)
3	(1/3 × year 3) + (2/3 × year 3)
4 (Jan-Apr)	1/3 × year 3

<div align="right">Figure 7</div>

Example 3:   Using the same video equipment from the previous example, calculate the amount of depreciation of the fourth year using SOYD, but now assume that the equipment was bought in February.
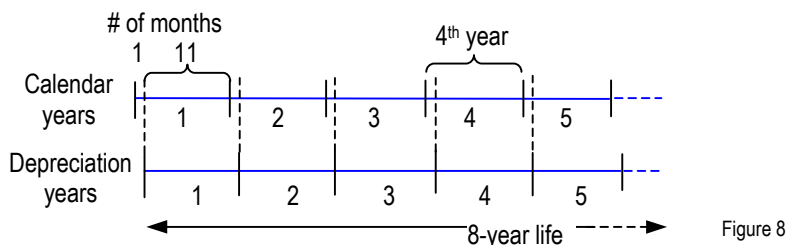
Figure 8

Solution: The diagram in Figure 8 helps building the solution. The fourth year is calculated by adding 1/12 of the third depreciation year to 11/12 of the fourth depreciation year. If data from previous example has not been changed yet, the following keystroke sequence can be used:

3   f SOYD   1   2   ÷   STO 0

Figure 9

This is the depreciation amount for 1/12 of the 3rd year, and it is stored in R_0. Now calculate 11/12 of the fourth depreciation year, add it to R_0 and retrieve the accumulated value:

4   f SOYD   1   1   X   1   2   ÷   STO + 0   RCL 0

Figure 10

Answer: The amount of depreciation for the fourth year is $1,962.74 given that the first depreciation year was only 11 months long.

Additional Information

The *HP12C Owner's Handbook and Problem Solving Guide*, Part III Section 13, under Investment Analysis, has many examples on how to use programs with depreciation functions in more complex depreciation situations.