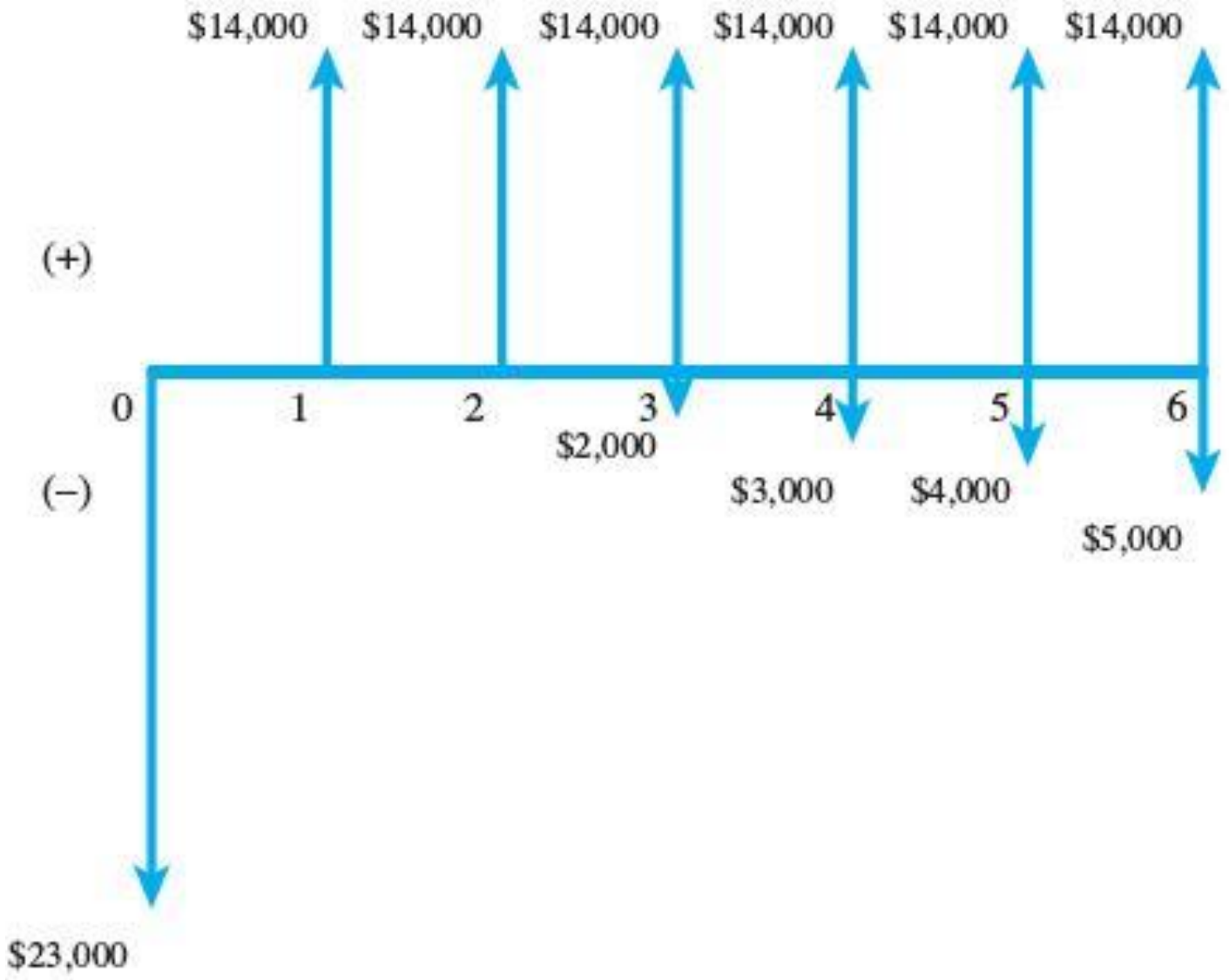
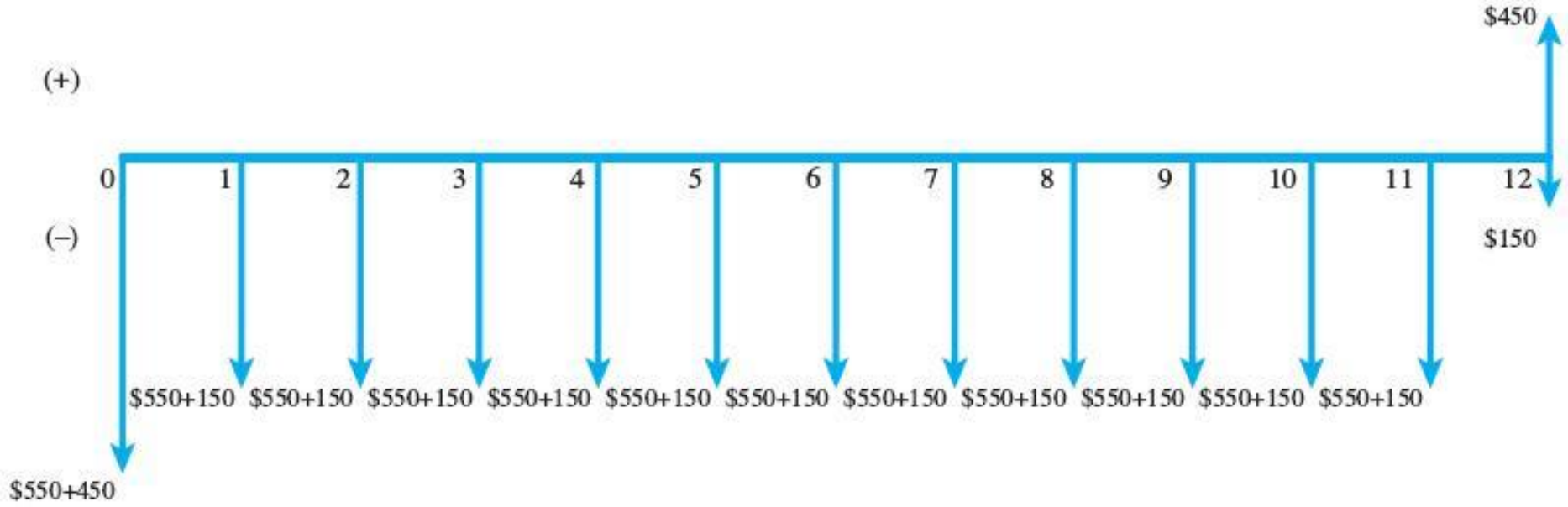
Review – Cash flow diagram

13. A laser cutting machine is purchased today for $23,000. There are no maintenance costs for the next two years. Maintenance at the end of year 3 is expected to be $2,000, with each subsequent year's maintenance costs exceeding the previous year's by $1,000. A revenue of $14,000 per year is expected. The planning horizon is 6 years. Draw the cash flow diagram.


$14,000
$14,000
$14,000
$14,000
$14,000
$14,000
(+)
0
1
2
3
4
5
6
$2,000
(–)
$3,000
$4,000
$5,000
$23,000

Review

14. You rent an apartment for $550 per month, payable at the beginning of the month. An initial deposit of $450 is required. Utilities are an additional $150 per month payable at the end of the month. The deposit is refundable at the time you move out, assuming a clean apartment in good condition. Draw a monthly cash flow diagram, assuming you keep the apartment for 12 full months.


$450
(+)
0
1
2
3
4
5
6
7
8
9
10
11
12
(–)
$150
$550+150
$550+150
$550+150
$550+150
$550+150
$550+150
$550+150
$550+150
$550+150
$550+150
$550+150
$550+450

Review– Calculation

15. How much money would have to be deposited today to accumulate:

a. $10,000 after 6 years if the investment earns 5%/year compounded annually?

b. $6,500 after 4 years if the investment earns 8%/year compounded annually?

c. $3,400 after 12 years if the investment earns 6%/year compounded annually?

d. $13,500 after 5 years if the investment earns 10%/year compounded annually?

a. P=PV(0.05,6,,-10000)=7462.15

b. P=PV(0.08,4,,-6500)=4777.69

c. P=PV(0.06,12,,-3400)=1689.70

d. P=PV(0.1,5,,-13500)=8382.44

Review

16. The cash flow profile for an investment is given below and the interest rate is 6.5% compounded annually. Find the present worth and future worth of this cash flow series.

End of Year	Net Cash Flow	End of Year	Net Cash Flow
0	$0	4	−$300
1	−$500	5	$500
2	$200	6	−$200
3	$400	7	$100

P=100*NPV(0.065,-5,2,4,-3,5,-2,1)=97.02

F=FV(0.065,7,,-97.02)=150.77

Review

17. Jason has been making equal annual payments of $7,500 to repay a college loan. He wishes to pay off the loan immediately after having made an annual payment. He has eight payments remaining. With an annual compound interest rate of 6%, how much should Jason pay?

P=PV(0.06,8,-7500)=46573.45

Review

18. On Juan's 26th birthday, he deposited $7,500 in a retirement account. Each year thereafter he deposited $1,000 more than the previous year. Determine how much was in the account immediately after his 35th deposit if :

a. The account earned annual compound interest of 5%.

b. The account earned annual compound interest of 6%.

a. P=100*NPV(0.05,75,85,95,105,115,125,135,145,155)=79435.49

F=FV(0.05,9,,-79435.49)=123230.52

b. P=100*NPV(0.06,75,85,95,105,115,125,135,145,155)=75589.46

F=FV(0.06,9,,-75589.46)=127706.80

Review

19. Suppose you make 30 annual investments in a fund that pays 5% compounded annually. If your first deposit is $7,500 and each successive deposit is 5% greater than the preceding deposit, how much will be in the fund immediately after the 30th deposit?

C2=C1*1.05,……, C30=C29*1.05

P=NPV(0.05,C1:C30)=214285.71

F=FV(0.05,30,,-214285.71)=926130.51

7500	$214,285.71
7875	
8268.75	
8682.188	
9116.297	
9572.112	
10050.72	
10553.25	
11080.92	
11634.96	
12216.71	
12827.55	
13468.92	
14142.37	
14849.49	
15591.96	
16371.56	
17190.14	
18049.64	
18952.13	
19899.73	
20894.72	
21939.46	
23036.43	
24188.25	
25397.66	
26667.55	
28000.92	
29400.97	
30871.02	$926,130.51

Review

20. A refrigerator sold for $500. The store financed the refrigerator by charging 0.5% monthly interest on the unpaid balance. If the refrigerator is paid for with 30 equal end-of-month payments:

a. What will be the size of the monthly payments?

b. If the first payment is not made until one year after the purchase, what will be the size of the monthly payments?

a. A=PMT(0.005,30,-500)=17.99

b. F=FV(0.005,12,,-500)=530.84

A=PMT(0.005,30,-530.84)=19.10