35.19 A contractor leases a piece of equipment for $50K down and $30K per year for a project expected to take 3 years. After the third year, the equipment is still needed due to a schedule delay and the contractor must pay $40K per year to continue to lease for the fourth and fifth years. After the fifth year, the project is completed and the equipment is returned. How much annual revenue is required to ensure the project has a 18% return on investment?

A. $33K

B. $44K

C. $49K

D. $56K

Draw a cash flow diagram or make a list of cash flows.

For year 0 there is a payment (negative cash flow) of -$50K.

For years 1 through 3 there is a negative cash flow of -$30K.

For years 4 and 5 there is a negative cash flow of -$40K.

For years 1 through 5 there is a positive cash flow of R, the unknown revenue.

Write an expression for the present value. For convenience, overstate the costs in years 1 through 3 by showing a negative -$40K cash flow for the entire 5 years, then offset with a *positive* cash flow of $10K for the first 3 years only. (Annualized cash flows can only be used if they start in year 1. Otherwise years 4 and 5 would have to be dealt with as independent future payments of an additional $10K which is equally valid but creates a bit more work.) Set the present value equal to zero and determine the revenue that will make the ROI 18%. Use the 18% Factor Table as needed.

$$PV = -\$50,000 - \$40,000\,(P/A, 18\%, 5) + \$10,000\,(P/A, 18\%, 3) + R\,(P/A, 18\%, 5) = 0$$

$$PV = -\$50,000 - \$40,000\,(3.1272) + \$10,000\,(2.1743) + R\,(3.1272) = 0$$

$$-\$50,000 - \$125,088 + \$21,743 + R\,(3.1272) = 0$$

$$R\,(3.1272) = \$153,345$$

$$R = \$49,036$$

Answer B