

QUIZ No. 3
06/19/08

DO YOUR WORK ON THIS HANDOUT. THIS WILL EXPEDITE THE GRADING OF THE PAPERS.

NAME _____

QUIZ SCORE _____

Read these instructions!!

Please read the problems carefully and provide the information requested and only the information requested in each question. Use the minimum amount of work required to answer each question. Show all your work. The test is worth 10 points. (about 10% of your total grade).

The test papers are to be handed in no later than 2:30 P.M. or 60 minutes after we start, whichever is later. It is unfair to your fellow students who hand in their papers on time to use more time than they had.

The test is open notes and open book. Use your calculator or laptop if needed, but be sure to explain what you did.

If you want to ask a question, come to me and ask me. **However, given the short length of the test you are better off making and stating an assumption instead.** If you want to borrow your neighbor's calculator, ask me to do it for you. No talking to your neighbors.

Move on to the next problem if you are stuck.

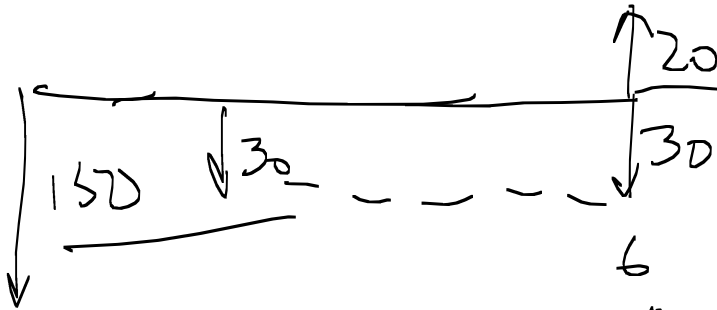
Good luck, I hope you all do well.

QUIZ No. 3
 06/19/08

Select the less
 Service - negative NPV

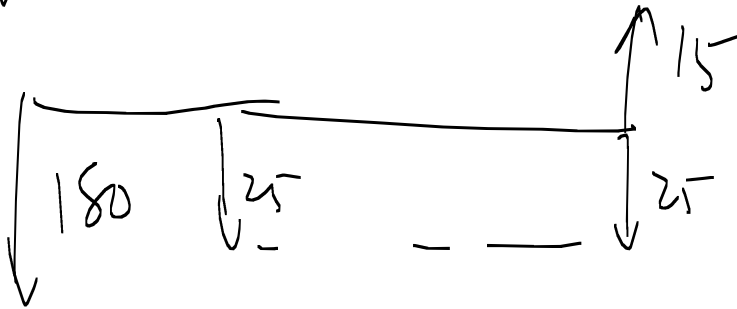
Problem No. 1 (2.5 points)

You are to select between two different CAD systems for your engineering office. CAD_A would cost \$150,000 to purchase and install. In addition, the software license will cost \$30,000 a year. You intend to use this system (or system CAD_B) for 6 years. You can sell CAD_A for \$20,000 at the end of the six years. CAD_B has an initial cost of \$180,000 and an annual software license for \$25,000. The salvage value of CAD_B is \$15,000. Your company uses 10% for MARR for engineering projects. Which would you select? - show your work.



$$-150 + PV(10\%, 6, 30)$$

$$- PV(10\%, 6, 20)$$



$$-180 + PV(10\%, 6, 25)$$

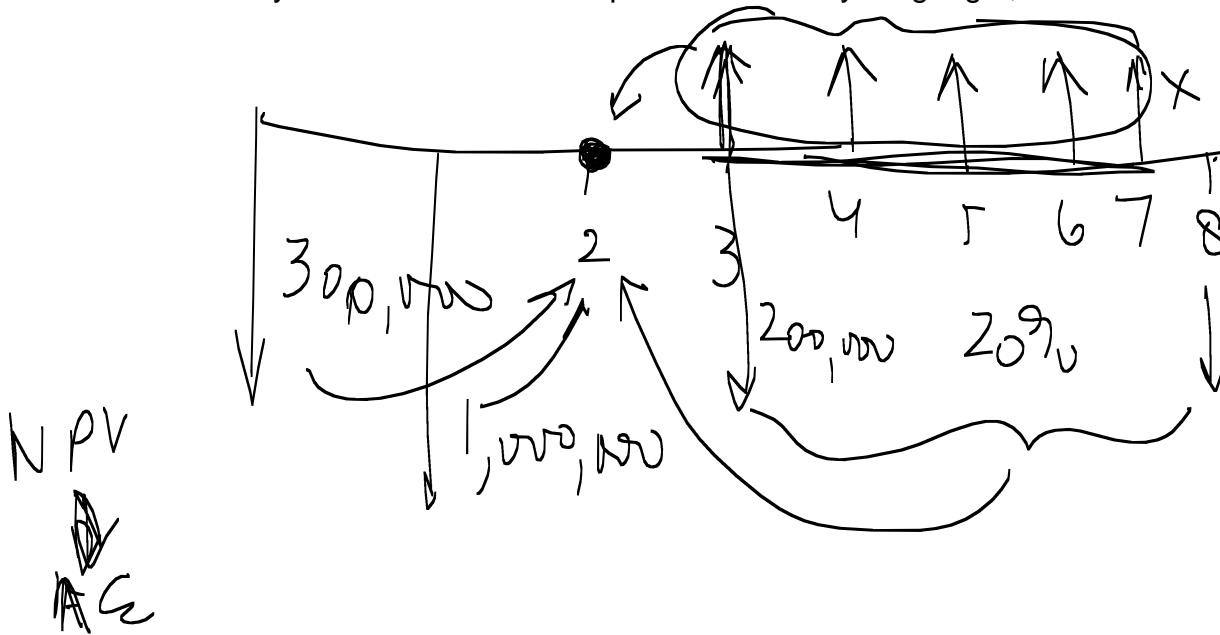
$$- PV(10\%, 6, 15)$$

QUIZ No. 3
 06/19/08

AG, Chyal

Problem No. 2 (2.5 points)

You are designing a gadget that you hope will sell 200,000 units per year. The expected manufacturing cost is \$3/unit. Additional costs are an initial investment (at time 0) of \$300,000 in development costs, \$1,000,000 in equipment at year one, and annual overhead costs of \$200,000 (Overhead costs are only allocated during years 3 through 8). Sales will begin in year 3 and last for 5 years. What is the total per unit cost for your gadget, if the MARR is 20%?



QUIZ No. 3
06/19/08

Problem No. 3 (2.5 points)

The DWP in Los Angeles needs to replace a section of the water system bringing water from the Owens Valley to LA. The old system lasted 100 years, and they assume that the replacement will do the same. The system will cost \$100,000,000. The DWP has an MARR of 12%. How much will they have to add to the annual cost of water going through the system in order to defray the cost of the new system?

$$A = P \cdot i = \frac{100 \times 10^6}{n} \times .12$$

$\frac{A}{P} \xrightarrow{n \rightarrow \infty}$

$$= 12 \times 10^6$$

QUIZ No. 3
06/19/08

Problem No. 4 (2.5 points)

A company needs to replace aging equipment in their facility. The use of any new equipment needs to be available for at least 6 years. They have found two types that will fit their requirements. The particulars for the two choices are given in the table below. Which Model should they choose? Show your work. (The company's MARR is 20%)

Item	Model A	Model B
Initial cost	\$50,000	\$70,000
Annual maintenance	\$4,000	\$2,000
Useful life	2 years	3 years
Salvage value at the end of useful life	\$10,000	\$15,000
Annual income from production	\$30,000	\$35,000

Handwritten notes:
 - A box is drawn around the Model A column.
 - "2 years" and "3 years" are circled.
 - "x 3 times" is written between the circled values.
 - "x 2 NPV" is written to the right of the circled values.
 - "or AE for each" is written below the salvage value row.
 - "at 2 and 3 years" is written below the annual income row.

Handwritten notes:
 Common factor 6 years
 PMT (2) (3)