**Homework Set 2**

**EGR 310**

1. (5 pts) $1000 is borrowed for one year at 1.5% per month. If the same amount could be borrowed at 18% per year, how much could be saved? What is the nominal and effective rate for each investment alternative. *(Chapter 3)*
2. (5 pts) If you invest $3000 into an account that compounds 7% continuously, what is the annual effective rate? *(Chapter 3)*
3. (10 pts) You just bought a house for $500,000. You put 20% down and financed the rest over 20 years at 3% nominal interest. Assuming equal monthly payments over the term of the loan, what are the monthly payments? What is the effective rate? *(Chapter 4)*
4. (10 pts) What would you need to invest today in an account that had a nominal rate of 12% compounded quarterly, if you wanted $9000 in 5 years? What would be the investment required if the account compounded monthly? What is the effective rate of each investment? *(Chapter 3)*
5. (10 pts) Assume we receive $1200 at the end of each year for 6 years. What is the equivalent value of the cash flows at time period 0 assuming 5% interest? What is the equivalent value at the end of time period 6 assuming 5% interest? *(Chapter 4)*
6. (10 pts) Assume the following cash flows: *(Chapter 4)*



Assuming an 8% interest rate, what is A?

1. (10 pts) The maintenance on a piece of equipment is $800 at the end of year 1 and increases $200/yr each year until the end of the 4 year life of the equipment. Assuming you could invest at 6%, what amount would you need today to cover all the maintenance costs in the future? *(Chapter 4)*
2. (10 pts) Assuming you are earning $60,000/yr and expect a 3% raise every year for the next seven years. If you invest 10% of your salary each year into a 401K that returns 3% per year, what will the value of the 401K be after 7 years? *(Chapter 4)*
3. (10 pts) Use Present Worth Analysis to determine which investment is best (which has the lowest present cost). Assume a 4% interest rate. *(Chapter 5)*

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| --- | --- | --- |
| Year | Alt A | Alt B |
| 0 | -$4,000 | -$2,000 |
| 1 | -$500 | -$500 |
| 2 | -$500 | -$800 |
| 3 | -$500 | -$1,100 |
| 4 | -$500 | -$1,400 |
| 5 | -$500 | -$1,700 |
| 6 | -$500 | -$2,000 |

1. (10 pts) To maintain a gravesite requires $600/yr perpetually. What amount needs to be invested today at 5% interest to provide $600/yr perpetually? *(Chapter 5)*
2. (10 pts) Use Net Present Worth Analyses to determine the best of the following 3 mutually exclusive investments. Assume a useful life of 8 years and interest rate of 7%: *(Chapter 5)*

|  |  |  |  |
| --- | --- | --- | --- |
|   | **Alt A** | **Alt B** | **Alt C** |
| **Initial Investment** | $10,000 | $12,000 | $15,000 |
| **O&M Costs** | $800 | $500 | $800 |
| **Annual Benefit** | $2,200 | $2,400 | $3,000 |
| **Salvage Value** | $3,000 | $4,000 | $5,000 |