IE2111 ISE Principles & Practice II
Solutions to Assignment #1

(***a***) Effective monthly rate = 0.06 / 12
= 0.005 or **<u>0.5</u>% per month**

(***b***) Effective annual rate $= \left(1+\dfrac{0.06}{12}\right)^{12} - 1$
= 0.061678 or **<u>6.1678</u>%** per year

(***c***) End-of-Month payment amount = 100,000 [*A*/*P*, 0.5%, 60]
= 100,000 (0.0193328)
= **$ <u>1,933.28</u>**

(***d***) Immediately after the 36th payment, there are 24 more monthly payments of $1,933.28 each to go. The balance still owe to the bank is the present equivalent value at the end of the 36th month, of the 24 more outstanding monthly payments.

Balance owed = 1,933.28 [*P*/*A*, 0.5%, 24]
= 1,933.28 (22.562866)
= **$ <u>43,620.34</u>**

(***e***) If Jane now pays this outstanding balance over the next 12 months, new monthly payment amount is

= 43,620.34 [*A*/*P*, 0.5%, 12]
= 43,620.34 (0.086066430)
= **$ <u>3,754.25</u>**

(***f***) Donald can afford to pay only $1,609 per month for a $100,000 loan at 9% per year compounded monthly. Let *N* be the number of months needed to repay the loan.

100,000 [*A*/*P*, 9%/12, *N*] = 1,609

$$100{,}000\left(\frac{0.0075(1+0.0075)^{N}}{(1+0.0075)^{N}-1}\right)=1{,}609$$

Using any equation solver: N = 83.9933 months

Hence Donald will require **<u>84 months</u>** to pay back the loan.