

# Word Practice

*Brightness:* Given two stars of magnitudes  $m_1$  and  $m_2$  have apparent brightness  $b_1$  and  $b_2$  respectively, then

$$m_2 - m_1 = 2.5 \log \left( \frac{b_1}{b_2} \right)$$

1. Find the magnitude  $m$  of a star that is 650 times as bright as one of magnitude 7.25

2. Chad just graduated but does not have a job lined up yet. In his last year of graduate school he made ends meet by using his credit card and now has a balance of \$7,000. His credit card compounds monthly with an annual interest rate of 19.9%. Assume the worst and that Chad won't find a job for the next two years and will have to move in with his parents. He won't be able to make any payments on his credit card bill.

Just before graduation, Chad received an ad for a State Farm Good Neighbor Visa Credit Card. The card will transfer his balance (with a 2.90% balance transfer fee) and then give him a lower annual interest rate of 10.24% that is still compounded monthly. Should he take this option instead of staying with his first credit card?

3. You have four ten-year subsidized loans you took out to pay for college. Below is a table of the loans taken and their respective effective annual interest rates (AIR):

loan (\$)	8,000	9,000	10,000	12,000
AIR (%)	3.51	4.22	5.01	6.31

After graduation you are given the option of consolidating (that is take out one loan to pay off *all* the balances on your current loans). Assume all loans are continuously compounded once interest start accruing. You do not have a job lined up yet so you doubt you will be able to make any payments for the three years, what rate would you need to consolidate your loans at to be in a better position three years from now?