Name
SHOW AS MUCH WORK AS POSSIBLE BECAUSE YOU MAY RECEIVE PARTIAL CREDIT FOR THE WORK YOU DO IF YOUR ANSWER IS INCORRECT.

1. You want to borrow $18,000 to buy a new car and your bank is willing to loan you the money at 5.7% compounded monthly for 5 years.

    a. How much will your monthly payments be?

    $345.49

    $$D = 18000, r = 5.7\% = 0.057, m = 12, t = 5, \frac{r}{m} = 0.00475, mt = 60$$

    $$P = D \cdot \frac{r/m}{1 - \left(1 + \frac{r}{m}\right)^{-mt}}$$

    $$P = 18000 \cdot \frac{0.00475}{1 - \left(1.00475\right)^{-60}} = 345.49$$

    b. Unfortunately, you can only afford a payment of $300 per month. As a result, what is the most money you could borrow (assuming the same interest rate and term)?

    $15,630.20

    $$P = 300, r = 5.7\% = 0.057, m = 12, t = 5, \frac{r}{m} = 0.00475, mt = 60$$

    $$PV = P \cdot \frac{1 - \left(1 + \frac{r}{m}\right)^{-mt}}{r/m}$$

    $$PV = 300 \cdot \frac{1 - \left(1.00475\right)^{-60}}{0.00475} = 15630.20$$

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1. You want to buy a $14,000 new car and the dealership's finance office is willing to loan you the money at 3.9% compounded monthly for 3 years.

a. How much will your monthly payments be?

$412.72

$$D = 14000, r = 3.9\% = 0.039, m = 12, t = 3, \frac{r}{m} = 0.00325, mt = 36$$

$$P = D \cdot \frac{r/m}{1 - \left(1 + \frac{r}{m}\right)^{-mt}}$$

$$P = 14000 \cdot \frac{0.00325}{1 - (1.00325)^{-36}} = 412.72$$

b. Unfortunately, you can only afford a payment of $350 per month. As a result, what is the most expensive car you could buy (assuming the same interest rate and term)?

$11,872.65

$$P = 350, r = 3.9\% = 0.039, m = 12, t = 3, \frac{r}{m} = 0.00325, mt = 36$$

$$PV = P \cdot \frac{1 - \left(1 + \frac{r}{m}\right)^{-mt}}{r/m}$$

$$PV = 350 \cdot \frac{1 - (1.00325)^{-36}}{0.00325} = 11872.65$$