The Dalton Family wants to take out a $50,000, 10-year loan with an APR of 4.15%. After calculating their monthly budget, they decide that they can only pay $450 per month toward loan debt reduction. Can they afford this loan?

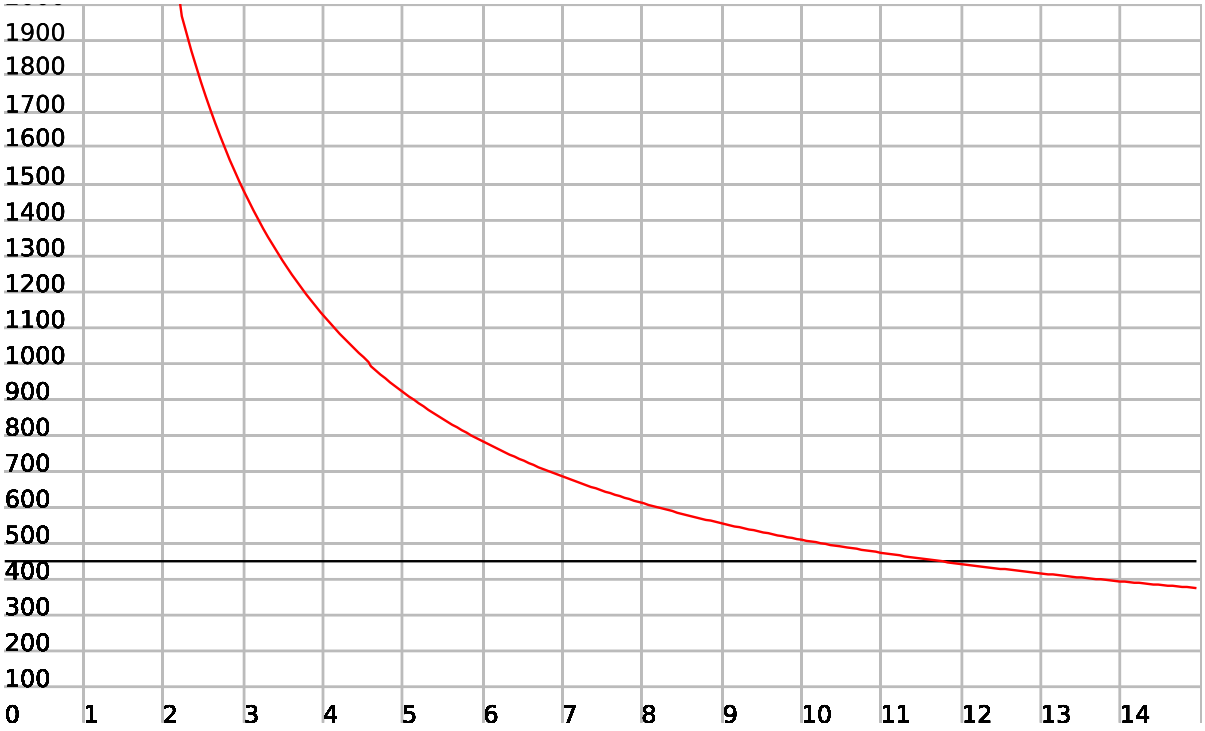
1) How can the monthly payment formula be used to examine this situation?

Monthly Payment Formula

$$M = \frac{p\left(\frac{r}{12}\right)\left(1+\frac{r}{12}\right)^{12t}}{\left(1+\frac{r}{12}\right)^{12t}-1}$$

where M = monthly payment
p = principal
r = interest rate
t = number of years

2) How can the graph of the monthly payment formula be used to examine this situation?



3) How can the loan length formula be used to examine this situation?

Loan Length Formula

$$t = \frac{\ln\left(\frac{M}{p}\right) - \left(\ln\left(\frac{M}{p} - \frac{r}{12}\right)\right)}{12\ln\left(1+\frac{r}{12}\right)}$$

where M = monthly payment
p = principal
r = interest rate
t = number of years