Loan Payment Formula for Installment Loans

The regular payment amount, *PMT*, required to repay a loan of *P* dollars paid *n* times per year over *t* years at an annual rate *r* is given by

$$PMT = \frac{P\left(\frac{r}{n}\right)}{1-\left(1+\frac{r}{n}\right)^{-nt}}$$

On a scientific calculator you will need to enter **extra parentheses** to ensure the calculations are done in the correct order. The denominator and the exponent need to be inside parentheses.

$$PMT = \frac{P\left(\frac{r}{n}\right)}{\left(1-\left(1+\frac{r}{n}\right)^{(-nt)}\right)}$$

The key sequence would be

$$P \times r \div n \div (1-(1+r \div n)\text{^}(-n \times t)) =$$

Note: (1)To raise to a power you may need to use ^ or y^x or x^y.
(2) You may need to enter n first and then press the (-) sign key.

Example: Calculate the monthly payment for a loan of $200,000 if the interest rate is 8% and the loan is for 20 years.

P = 200,000; r = 0.08; n = 12; t = 20

$$200000 \times .08 \div 12 \div (1-(1+.08 \div 12)\text{^}(-12 \times 20)) = 1672.880123798$$

$$\approx \$1{,}672.88$$