LOAN PAYMENTS

P = amount borrow (loan principal)
PMT = regular payment amount
APR = annual percentage rate
(in decimal form if doing calculations by hand)
n = number of payments per year
Y = loan term in years

Formula	**Example**	**Using TVM Solver (TI-83:FINANCE; TI-83+, TI-84:APPS)**
Loan Payment (Installment loans) Also to pay off a credit card balance over a period of time. $$PMT = \frac{P \times \left(\frac{APR}{n}\right)}{\left[1 - \left(1 + \frac{APR}{n}\right)^{(-n \times Y)}\right]}$$	You have student loans totaling $8,500 when you graduate from Northern Arizona University. The APR is 8.5% and the loan term is 10 years. $$PMT = \frac{8500 \times \left(\frac{.085}{12}\right)}{\left[1 - \left(1 + \frac{.085}{12}\right)^{(-12 \times 10)}\right]} = \$105.39$$ Total payment over the lifetime of the loan = $$\frac{\$105.39}{month} \times \frac{12\ months}{year} \times 10\ years = \$12,646.80$$ Total interest paid = Total payment – Loan principal = $12,646.80 – $8,500.00 = $4,146.80	(1) Press 2nd x^{-1} (FINANCE) or APPS (2) Choose 1: TVM Solver (3) Enter N = 12 × 10 = 120 I% = 8.5 PV = -8500 (calculator considers this an outflow of cash) PMT = 0 FV = 0 P/Y = 12 (number of payments per year) C/Y = 12 (number of compounding periods per year) PMT = highlight END for end of month deposits (4) Arrow up to PMT since we are looking for the monthly payment (5) Press ALPHA ENTER (SOLVE). ▪ PMT = $105.39 Total interest using the TVM Solver. (6) Press 2nd Mode (Quit) (7) Press 2nd x^{-1} (FINANCE) or APPS (2) Choose A: Σ Int((9) Enter: 1,120) then press ENTER Total interest = $4,146.54 (The small difference with the value in column 2 is due to the rounding in those calculations)

LOAN PAYMENTS (continued)

Principal and interest payment portions change as the loan is paid down	**End of**	Interest (decrease) $= \frac{APR}{12} \times balance$ $= \frac{.085}{12} \times balance$	Payment toward principal (increase) = PMT – Interest	New principal = previous month's principal – payment toward principal
	Month 1	$\frac{.085}{12} \times \$8{,}500 = \$60.21$	\$105.39 – \$60.21 = \$45.18	\$8,500 – \$45.18 = \$8,454.82
	Month 2	$\frac{.085}{12} \times \$8{,}454.82 = \$59.89$	\$105.39 – \$59.89 = \$45.50	\$8,454.82 – \$45.50 = \$8,409.32
	Month 3	$\frac{.085}{12} \times \$8{,}409.32 = \$59.57$	\$105.39 – \$59.57 = \$45.82	\$8,409.32 – \$45.82 = \$8,363.50