$$20{,}000 = \frac{612.36\,\ddot{a}_{\overline{240}|}}{(1+i)^{8}} - \frac{20{,}000}{(1+(2/30)i)(1+i)^{2}} - \frac{20{,}000}{(1+(8/30)i)(1+i)^{5}}$$

Annual percentage rate (I) = wi = .1025 = 10.25%

<u>Example (ii)</u>: Student loan

A student loan consists of 8 advances: $1800 on 9-5-78, 9-5-79, 9-5-80, and 9-5-81; plus $1000 on 1-5-79, 1-5-80, 1-5-81, and 1-5-82. The borrower is to make 50 monthly payments of $240 each beginning 7-1-78 (prior to first advance).
Unit-period = 1 month. Unit-periods per year (w) = 12.
Zero point is date of first payment since it precedes first advance.
From 7-1-78 to 9-5-78 = (2 + 4/30) unit-periods.

" " " 9-5-79 = (14 + 4/30) "

" " " 9-5-80 = (26 + 4/30) "

" " " 9-5-81 = (38 + 4/30) "

" " " 1-5-79 = (6 + 4/30) "

" " " 1-5-80 = (18 + 4/30) "

" " " 1-5-81 = (30 + 4/30) "

" " " 1-5-82 = (42 + 4/30) "

Since the zero point is date of first payment, the general equation in paragraph (b)(8) of this section is written in the single advance form below by treating the first payment as a negative advance and the 8 advances as negative payments:

$$-240 = \frac{240\,\ddot{a}_{\overline{49}|}}{(1+i)} - \frac{1800}{(1+(4/30)i)}\left[\frac{1}{(1+i)^{2}} + \frac{1}{(1+i)^{14}} + \frac{1}{(1+i)^{26}} + \frac{1}{(1+i)^{38}}\right]$$

$$- \frac{1000}{(1+(4/30)i)}\left[\frac{1}{(1+i)^{6}} + \frac{1}{(1+i)^{18}} + \frac{1}{(1+i)^{30}} + \frac{1}{(1+i)^{42}}\right]$$

Annual percentage rate (I) = wi = .3204 = 32.04%