This book has permission to use the "N&K method of COLORS".

37) Question: Julie opened a bank account. She deposited $1000 as the beginning amount in the account. The bank manager told her that the account would grow at 5% interest compounded annually.
The bank manager gave her the formula $= \$1000(i)^y$*; where*
"i" is based on the annual compound interest and
"y" represents the number of years after which the compound interest is to be calculated.
What should Julie replace the "i" with, if she wants to find the amount of money in her account after "y" years?
nc

For speed, while solving something similar, only THINK the words in blue; WRITE only the words in other COLORS.

Given: 1) Julie deposited $1000 as the beginning amount in the account.
2) The formula for amount of money in her account after "y" years $= \$1000(i)^y$;
Solve: What should Julie replace the "i" with, to find the amount of money in her account after "y" years?

Road Map of Solution:
First Step: Find amount after "1" year
Second Step: Find amount after "2" years
Third Step: Find amount after "3" years
Fourth Step: Find trend

At 5% interest compounded annually,

$$\text{AmtAtEndOfYear1} = \text{AmtAtStartOfYear1} + 5\% \text{ of } \text{AmtAtStartOfYear1} \quad \ldots\ldots\ldots\ldots \quad \text{equation \#1}$$
$$= \$1000 + 5\% \text{ of } \$1000$$
$$= \$1000 + 5\% \times \$1000$$
$$\text{AmtAtEndOfYear1} = [(\ 1 + 5\%\ ) \times \$1000]$$
$$\text{AmtAtEndOfYear1} = \text{AmtAtStartOfYear2}$$

$$\text{AmtAtEndOfYear2} = \text{AmtAtStartOfYear2} + 5\% \text{ of } \text{AmtAtStartOfYear2} \quad \ldots\ldots\ldots\ldots \quad \text{equation \#2}$$
$$= [(\ 1 + 5\%\ ) \times \$1000] + 5\% \times [(\ 1 + 5\%\ ) \times \$1000]$$
$$= (\ 1 + 5\%\ ) \times [(\ 1 + 5\%\ ) \times \$1000]$$
$$\text{AmtAtEndOfYear2} = \times [(\ 1 + 5\%\ )^2 \times \$1000]$$
$$\text{AmtAtEndOfYear2} = \text{AmtAtStartOfYear3}$$

$$\text{AmtAtEndOfYear3} = \text{AmtAtStartOfYear3} + 5\% \text{ of } \text{AmtAtStartOfYear3} \quad \ldots\ldots\ldots\ldots \quad \text{equation \#3}$$
$$= [(\ 1 + 5\%\ )^2 \times \$1000] + 5\% \times [(\ 1 + 5\%\ )^2 \times \$1000]$$
$$= (\ 1 + 5\%\ ) \times [(\ 1 + 5\%\ )^2 \times \$1000]$$
$$\text{AmtAtEndOfYear3} = \times [(\ 1 + 5\%\ )^3 \times \$1000]$$

Similarly, based on the trend above, at 5% interest compounded annually,

$$\text{AmtAtEndOfYear6} = [(\ 1 + 5\%\ )^6 \times \$1000] \quad \ldots\ldots \quad \text{equation \#4}$$
$$\text{AmtAtEndOfYear6} = \left[\left(\ 1 + \frac{5}{100}\right)^6 \times \$1000\right] \quad \ldots\ldots \quad \text{equation \#4b}$$
$$\text{AmtAtEndOfYear6} = [(\ 1 + 0.05\ )^6 \times \$1000]$$
$$\text{AmtAtEndOfYear6} = [(\ 1.05\ )^6 \times \$1000] \quad \ldots\ldots \quad \text{equation \#4c}$$

Comparing the formula given by the bank manager with the one calculated above (eq#4c), we see,

$$\$1000(i)^y = [(\ 1.05\ )^6 \times \$1000]$$

Therefore, $i = 1.05$ ..... *Answer*