

COMPOUND INTEREST (15a)

... INVOLVES ADDING IN INTEREST AT REGULAR INTERVALS, SO YOU'RE EARNING INTEREST ON INTEREST!

LET: P = INITIAL INVESTMENT (\$)
 r = ANNUAL INTEREST RATE (eg, 2% = 0.02)
 n = # OF TIMES, PER YEAR, THAT INTEREST IS ADDED IN; # OF COMPOUNDING PERIODS/YEAR

MONTHLY: $n = 12$ WEEKLY: $n = 52$ DAILY: $n = 365$

AFTER THIS TIME... ... YOU'LL HAVE THIS MUCH \$\$...

<p>1 COMPOUNDING PERIOD</p> <p>2 " "</p> <p>⋮</p> <p>$n = 1$ YEAR</p> <p>⋮</p> <p>$2n = 2$ YEARS</p>	<p>$P + P \cdot r \cdot \frac{1}{n} = P \left(1 + \frac{r}{n}\right)^1$</p> <p>$P \left(1 + \frac{r}{n}\right) + P \left(1 + \frac{r}{n}\right) \cdot r \cdot \frac{1}{n} = P \left(1 + \frac{r}{n}\right)^2$</p> <p>⋮</p> <p>$P \left(1 + \frac{r}{n}\right)^{n-1}$</p> <p>$P \left(1 + \frac{r}{n}\right)^{n-2}$</p> <p>⋮</p> <p>$P \left(1 + \frac{r}{n}\right)^{n-1}$</p>
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$$A = P \left(1 + \frac{r}{n}\right)^{nt}$$

USING THE COMPOUND INTEREST FORMULA (15b)

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

EX SUPPOSE \$1000 IS INVESTED AT 3% ANNUAL INTEREST, COMPOUNDED DAILY, FOR 5 YEARS. HOW MUCH MONEY WILL YOU HAVE?

$P = 1000$, $r = 0.03$, $n = 365$, $t = 5$

$$A = 1000 \left(1 + \frac{0.03}{365}\right)^{365 \cdot 5} = \$1,161.83$$

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BE ABLE TO DO THIS ON YOUR CALCULATOR!!