

Ex. 6.—(Number, Form 15).

How many monthly annuities of \$1 will it require to repay a loan of \$128 at 6% convertible half-yearly?

$$V = 128; a = 1; r \text{ (Table A)} = 1.004938..; t = .004938.. \log. r = .0021395; \\ Vt = .632143$$

$$\log. a = 0$$

$$\log. \frac{a}{S} = .4343209 \div .0021395 (\log. r) = 203$$

$$\log. (a - Vt) \text{ or } S = \bar{1} 5656791$$

monthly instalments (very nearly).

$$\log. \frac{a}{S} = .4343209$$

(By Table II, 203 monthly instalments of \$1 = \$128.001).

Ex. 7.—(Deferred Annuity, Form 17).

A has a term of 9 years in an estate worth \$100 per annum; B has a term of 18 years in the same estate in reversion after the term of 9 years; C has a further term of 27 years in reversion after the 27 years, and D has the reversion in perpetuity after the 54 years. What is the present value of the interest of each in the estate, at 4% compounded yearly?

$a = 100; r = 1.04; t = .04; \log. r = .01703, 33393; \log. t = \bar{2} 6020600$; for A, $n = 9$; for B, $n = 18$ and $d = 9$; for C, $n = 27$ and $d = 27$; for D, $V = \frac{a}{t}$ or p. v. of perpetuity and $d = 54$

A	B	C
(6) $9 \times \log. r = .1533001$	(6) $18 \times \log. r = .3066001$	(6) $27 \times \log. r = .4599002$
$r^9 = 1.42331$	$r^{18} = 2.02582$	$r^{27} = 2.88337$
$r^9 - 1 = .42331$	$r^{18} - 1 = 1.02582$	$r^{27} - 1 = 1.88337$
$\log. r^9 - 1 = 1.6266604$	$\log. r^{18} - 1 = .0110697$	$\log. r^{27} - 1 = .2749354$
$\log. a = 2$	$\log. a = 2$	$\log. a = 2$
$C^t \log. t = 1.3979400$	$C^t \log. t = 1.3979400$	$C^t \log. t = 1.3979400$
$C^t \log. r^9 = \bar{1} 8468999$	$C^t \log. r^{18} = \bar{1} 6933999$	$C^t \log. r^{27} = \bar{1} 5400998$
$\log. V = 2.8713003$	$\log. V = 3.1024096$	$\log. V = 3.2129752$
$V = \$743.533$	(17) $9 \times \log. r = .1533001$	(17) $27 \times \log. r = .4599002$
	$\log. D = 2.9491095$	$\log. D = 2.7530760$
	$D = \$889.425$	$D = \$566.337$

(By Table V).

$$\begin{aligned} \text{p.v. of } \$1 \text{ for 9 years} &= \frac{7.4353 \times 100}{16.3296} = 743.53 = \text{A's share} \\ \text{" } 27 \text{ " } &= \frac{16.3296}{7.4353} \\ \text{" } 9 \text{ " } &= \frac{7.4353}{8.8943 \times 100} = 889.43 = \text{B's " } \\ \text{" } 54 \text{ " } &= 21.9930 \\ \text{" } 27 \text{ " } &= 16.3296 \\ &= \frac{5.6634 \times 100}{21.9930} = 566.34 = \text{C's " } \\ &= 21.9930 \end{aligned}$$

$$\begin{aligned} D = \text{perpetuity } \frac{a}{t} &= 2500.00 \\ -(A + B + C) &= 2199.30 \\ D's \text{ share} &= \$300.70 \end{aligned}$$