Compound Interest Worksheet

1. $P = ?$ $A = \$6000$ $n = 12 \times 4 = 48$

$i: \frac{0.05 \mid 1\ yr}{yr \mid 12\ m} = 0.00417/m.$

$A = P(1+i)^n$

$6000 = P(1 + 0.00417)^{48}$

$6000 = P(1.00417)^{48}$

$\boxed{P = \$4913.64}$ approx.

2. $P = ?$ $A = \$20000$ $n = 12 \times 10 = 120$

$i: \frac{0.1 \mid 1\ yr}{yr \mid 12\ m.} = 0.00833/m$

$A = P(1+i)^n$

$20000 = P(1 + 0.00833)^{120}$

$\boxed{P = \$7391.07}$ approx.

3. $P = ?$ $A = \$5500$ $n = 4 \cdot 1 = 4$

$i: \frac{0.077 \mid 1\ yr}{yr \mid 4\ quarters} = 0.01925/quarter$

$A = P(1+i)^n$

$5500 = P(1 + 0.01925)^4$

$P = \boxed{\$5096.12}$

4) $P = ?$ $A = \$200\,000$ $n = 52 \cdot 15 = 780$

i: $\frac{0.069 \mid 1\ yr}{yr. \mid 52\ wk} = 0.00133$

$A = P(1+i)^n$

$200000 = P(1+0.00133)^{780}$

$\boxed{P = \$70\,923.84}$ approx.

5) Rule of 72: # of years $= \frac{72}{4.0} = \boxed{18 \text{ years}}$

6) Rule of 72: $40 = \frac{72}{i}$

$i = \frac{72}{40} = \boxed{1.8\%}$

7) Rule of 72: $5 = \frac{72}{i}$

$i = \frac{72}{5} = \boxed{14.4\%}$

8) $P = \$7600$ $n = 6$
$A = ?$ $i = 0.02$

$A = P(1+i)^n$

$A = 7600(1+0.02)^6$

$\boxed{A = \$8558.83}$

9) $P = \$1250$ $n = 2$

$A = ?$ $i = 0.035$

$A = P(1+i)^n$

$A = 1250(1+0.035)^2$

$\boxed{A = \$1339.03}$

10) $P = \$125$ $n = 10$

$A = ?$ $i = 0.10$ $I = ?$

$A = P(1+i)^n$

$A = 125(1+0.10)^{10}$

$A = 324.22$

$I = A - P = 324.22 - 125 = \boxed{\$199.22}$

11) $P = \$2300$ $n = 3$

$A = ?$ $i = 0.05$ $I = ?$

$A = P(1+i)^n$

$A = 2300(1+0.05)^3$

$A = 2662.54$

$I = A - P = 2662.54 - 2300 = \boxed{\$362.54}$

12) $\frac{0.037 \mid 1\ yr}{yr \mid 12\ m} = \boxed{0.00308} = \boxed{0.308\%}$

13) $12 \cdot 6 = \boxed{72}$

14) $A = \$50000 \quad n = 4 \cdot 1 = 4$

$P = ?$ $\quad i: \frac{0.08 \mid 1\ yr}{yr \mid 4\ quarters} = 0.02/quarter$

$A = P(1+i)^n$

$50000 = P(1+0.02)^4$

$\boxed{P = \$46192.27}$

15) $\frac{72}{6} = 12 \rightarrow$ cannot double in 10 years

16) a) $P = 10000 \quad A = ?$

$n = 2 \cdot 4 = 8 \quad i: \frac{0.043 \mid 1\ yr}{yr \mid 2\ semi} = 0.0215/semi$

$A = P(1+i)^n$

$A = 10000(1+0.0215)^8$ $\boxed{\$11855.15}$

b) $P = 10000 \quad A = ?$

$n = 2 \cdot 8 = 16 \quad i = 0.0215/semi$

$A = 10000(1+0.0215)^{16}$

$\boxed{A = \$14054.45}$

17) $A = 50000(1+0.00333)^{36}$

$A = \$56356.85$

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$A = 50000(1+0.000673)^{156}$

$A = \$55532.90$