Assignment #9

§6.1 #2, 4, 6, 12, 14, 16, 18, 22 — 44

#2

a) $I = Prt = 800(0.14)(5) = 560$ T

b) $S = P + I = 800 + 560 = 1360$ T

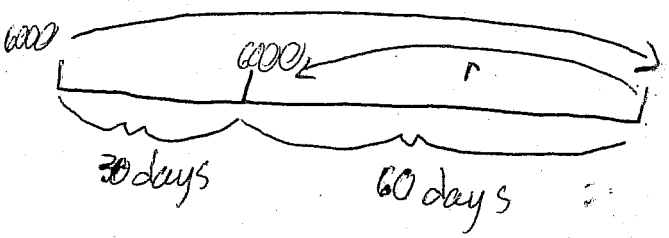
#4

a) $I = Prt = 1800(0.15)\left(\frac{9}{12}\right) = 202.50$ T

b) $S = P + I = 1800 + 202.50 = 2002.50$ T

6 $S = P(1+rt) = 1600(1+0.14(2)) = \$2048.00$ T

#12



$I = Prt = 6000(0.12)\left(\frac{90}{360}\right)$

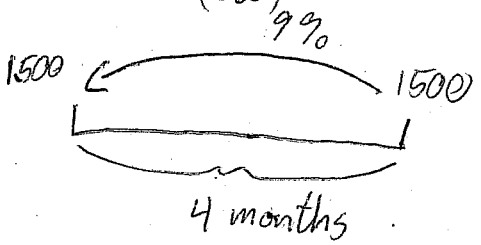
$= 180$

$I = Prt$

$180 = 6000r\left(\frac{60}{360}\right)$

$r = \frac{180}{6000\left(\frac{60}{360}\right)} = 0.18 = 18\%$ — 2

#14



$P = \frac{S}{(1+rt)} = \frac{1500}{(1+0.09\left(\frac{4}{12}\right))}$

$= 1456.31$ — 2

∴ will need $1500 + 1456.31 = 2956.31$ in september

#16 $P = \frac{S}{(1+rt)} = \frac{832}{(1+0.06(\frac{8}{12}))} = 800$ 2

#18 $S = P(1+rt)$

$13000 = 8500(1+0.11t)$

$13000 = 8500 + 935t$

$935t = 4500$ 2

$t = 4.8128$ years

$= 4$ years $0.8128(365)$ days

$= 4$ years 297 days

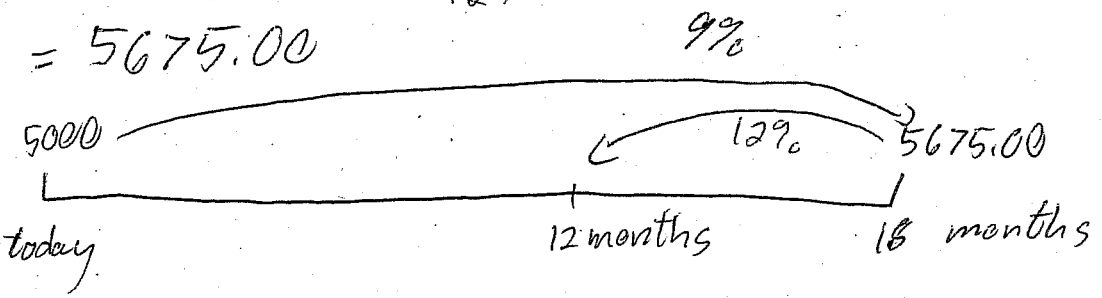
#22

a) $S = P(1+rt)$

$= 5000(1+0.09(\frac{18}{12}))$

$= 5675.00$ 1

b)



$P = \frac{S}{(1+rt)} = \frac{5675.00}{(1+0.12(\frac{6}{12}))} = 5353.77$ 2

∴ Sold for $5353.77.

6.2 # 2, 6, 8, 12, 26, 28, 36, 42, 44, 15, 18

#2a) 12%

b) 3 years

c) $i = \frac{j}{m} = \frac{12\%}{12} = 0.01$ 4

d) $n = mt = 12(3) = 36$

#6 $FV = PV(1+i)^n = 8600(1+0.05)^{16}$ $i = \frac{j}{m} = \frac{10\%}{2} = 0.05$

$= 18772.72$ $n = mt = 2(8) = 16$ 2

#8 $FV = PV(1+i)^n$ $i = \frac{j}{12} = \frac{12\%}{12} = \frac{0.12}{12} = 0.01$

$= 6300(1+0.01)^{36}$

$= 6300(1.01)^{36}$ $n = mt = 12(3) = 36$ 3

$= \$9013.84$

since $FV = PV + I$

$9013.84 = 6300 + I$

$I = 9013.84 - 6300 = \$2713.84$

#12 $PV = \frac{FV}{(1+i)^n}$ $i = \frac{j}{m} = \frac{9\%}{4} = \frac{0.09}{4}$

$n = mt = 4(25) = 100$ 2

$= \frac{100000}{(1+\frac{0.09}{4})^{100}}$

$= \$10806.08$

#26

6% compounded Continuously.

$$APY = e^r - 1 = e^{0.06} - 1 = 6.18\%$$ (best)

6% compounded semi-annually.

$$APY = (1+i)^m - 1 = \left(1 + \frac{6\%}{2}\right)^2 - 1$$

$$= 6.09\%$$ (worst)

2

6% compounded monthly

$$APY = (1+i)^m - 1 = \left(1 + \frac{6\%}{12}\right)^{12} - 1$$

$$= 6.17\%$$ (better)

#28 First Company:

$$APY = (1+i)^m - 1 = \left(1 + \frac{4.8\%}{12}\right)^{12} - 1$$

$$= 4.907\%$$

Second Company:

2

$$APY = (1+i)^m - 1 = \left(1 + \frac{4.82\%}{2}\right)^2 - 1$$

$$= 4.878\%$$

∴ the first company is best.

#36 $FV = PV(1+i)^n$ $m=1$

$14071 = 10000(1+\frac{j}{1})^7$ $n = mt = 1(7) = 7$

$1.4071 = (1+j)^7$

$\sqrt[7]{1.4071} = 1+j$

$\sqrt[7]{1.4071} - 1 = j$

$5\% = j$

2

#42 $FV = PV(1+i)^n$ $m=12$ $n = mt = 12t$

$15000 = 8000(1+\frac{0.09}{12})^{12t}$ $i = \frac{j}{12} = \frac{9\%}{12}$

$1.875 = (1.0075)^{12t}$

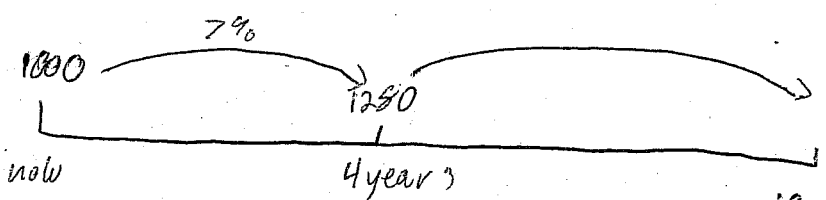
$\ln 1.875 = 12t \ln 1.0075$

$t = \frac{\ln 1.875}{12 \ln 1.0075}$

$= 7$ years.

2

#44



$S = P(1+rt)$

$= 1000(1+0.07(4))$

$= 1280$

$FV = PV(1+i)^n$

$= 1280(1+\frac{0.07}{4})^{24}$

$= 1941.05$

$m=4$

$i = \frac{j}{m} = \frac{0.07}{4}$

$n = mt = 4(6)$

$= 24$

2

#15 $S = Pe^{rt}$

$= 5100e^{0.09(4)}$

$= 7309.98$

#18 $S = Pe^{rt}$

$= 8000e^{0.085(\frac{9}{2})}$

$= 11\,727.56$

$\frac{1}{}$

#34 $S = Pe^{rt}$

$970 = 600e^{0.08t}$

$\frac{970}{600} = e^{0.08t}$

$\ln\left(\frac{970}{600}\right) = \ln e^{0.08t}$

$\ln\left(\frac{970}{600}\right) = 0.08t$

$t = \frac{\ln\left(\frac{970}{600}\right)}{0.08}$

$t = 6$ years

$\frac{2}{}$

Supplementary Problems:

Compound Interest:

i) • $FV = PV\left(1 + \frac{j}{m}\right)^{mt}$ $\quad j = 4\%$ $\quad m = 2$

$$24379.89 = 20000\left(1 + \frac{0.04}{2}\right)^{2t}$$

$$24379.89 = 20000(1.02)^{2t}$$

$$\frac{24379.89}{20000} = (1.02)^{2t}$$ $\quad$ 1/2

$$\ln\left(\frac{24379.89}{20000}\right) = 2t\ln(1.02)$$

$$t = \frac{\ln\left(\frac{24379.89}{20000}\right)}{2\ln(1.02)}$$

$$= 5 \text{ years}$$

ii) $m = 3$

$$FV = PV\left(1 + \frac{j}{m}\right)^{mt}$$

$$7392.45 = 50000\left(1 + \frac{j}{3}\right)^{3(10)}$$ $\quad$ 1/2

$$\left(1 + \frac{j}{3}\right)^{30} = 1.347849$$

$$j = 3\left[(1.347849)^{\frac{1}{30}} - 1\right] = 3\%$$