10.6

1) Find each of the following:

    a. S500 invested at 4% compounded annually for 10 years.

$$A = 500 \left(1 + \frac{.04}{1}\right)^{1 \cdot 10}$$
$$A = 500(1.04)^{10}$$
$$A = 500(1.48)$$
$$A = \$740.12$$

    b. S600 invested at 6% compounded annually for 6 years.

$$A = 600 \left(1 + \frac{.06}{1}\right)^{1 \cdot 6}$$
$$A = 600(1.06)^{6}$$
$$A = 600(1.42)$$
$$A = \$851.11$$

    c. S750 invested at 3% compounded annually for 8 years.

$$A = 750 \left(1 + \frac{.03}{1}\right)^{1 \cdot 8}$$
$$A = 750(1.03)^{8}$$
$$A = 750(1.27)$$
$$A = \$950.08$$

    d. S1500 invested at 4% compounded semiannually for 7 years.

$$A = 1500 \left(1 + \frac{.04}{2}\right)^{2 \cdot 7}$$
$$A = 1500(1.02)^{14}$$
$$A = 1500(1.32)$$
$$A = \$1979.22$$

    e. S900 invested at 6% compounded semiannually for 5 years.

$$A = 900 \left(1 + \frac{.06}{2}\right)^{2 \cdot 5}$$
$$A = 900(1.03)^{10}$$
$$A = 900(1.34)$$
$$A = \$1209.52$$

    f. $950 invested at 4% compounded semiannually for 12 years.

$$A = 950 \left(1 + \frac{.04}{2}\right)^{(2 \cdot 12)}$$
$$A = 950(1.02)^{24}$$
$$A = 950(1.61)$$
$$A = \$1528.02$$

g. $2000 invested at 5% compounded quarterly for 6 years.

$$A = 200\left(1 + \frac{.05}{2}\right)^{4\cdot6}$$
$$A = 200(1.0125)^{24}$$
$$A = 200(1.35)$$
$$A = \$2694.70$$

h. $2250 invested at 4% compounded quarterly for 9 years.

$$A = 2250\left(1 + \frac{.04}{4}\right)^{4\cdot9}$$
$$A = 2250(1.01)^{36}$$
$$A = 2250(1.43)$$
$$A = \$3219.23$$

i. $3500 invested at 6% compounded quarterly for 12 years.

$$A = 3500\left(1 + \frac{.06}{4}\right)^{4\cdot12}$$
$$A = 3500(1.015)^{48}$$
$$A = 3500(2.04)$$
$$A = \$7,152.17$$

j. All of the above compounded continuously.

$$A = 500e^{.04\cdot10}$$
$$A = 500e^{.4}$$
$$A = 500(1.49)$$
$$A = \$745.91$$

$$A = 600e^{.06\cdot6}$$
$$A = 600e^{.36}$$
$$A = 600(1.43)$$
$$A = \$860.00$$

$$A = 750e^{.03\cdot8}$$
$$A = 750e^{.24}$$
$$A = 750(1.27)$$
$$A = \$953.44$$

$$A = 1500e^{.04\cdot7}$$
$$A = 1500e^{.28}$$
$$A = 1500(1.32)$$
$$A = \$1984.69$$

$$A = 900e^{.06\cdot5}$$
$$A = 900e^{.30}$$

$$A = 900(1.35)$$
$$A = \$1214.87$$

$$A = 950e^{.04 \cdot 12}$$
$$A = 950e^{.48}$$
$$A = 950(1.62)$$
$$A = \$1535.27$$

$$A = 2000e^{.05 \cdot 6}$$
$$A = 2000e^{.3}$$
$$A = 2000(1.35)$$
$$A = \$2699.72$$

$$A = 2250e^{.04 \cdot 9}$$
$$A = 2250e^{.36}$$
$$A = 2250(1.43)$$
$$A = \$3224.99$$

$$A = 3500e^{.06 \cdot 12}$$
$$A = 3500e^{.72}$$
$$A = 3500(2.05)$$
$$A = \$7190.52$$

3) What principal will amount to S3500 if invested at 4% interest compounded quarterly for 5 years?

$$3500 = P\left(1 + \frac{.04}{4}\right)^{4 \cdot 5}$$
$$3500 = P(1.01)^{20}$$
$$\frac{3500}{1.22} = \frac{P(1.22)}{1.22}$$
$$\$2868.41 = P$$

5) What principal will amount to S2500 if invested at 5% interest compounded semiannually for 7.5 years?

$$2500 = P\left(1 + \frac{.05}{2}\right)^{2 \cdot 7.5}$$
$$2500 = P(1.025)^{1.5}$$
$$\frac{2500}{1.45} = \frac{P(1.45)}{1.45}$$
$$\$1726.16 = P$$

7) A thousand dollars is left in a bank savings account drawing 7% interest, compounded quarterly for 10 years. What is the balance at the end of that time?

$$A = 1000\left(1 + \frac{.07}{4}\right)^{4 \cdot 10}$$
$$A = 100(1.0175)^{40}$$

$$A = 1000(2.00)$$
$$A = \$2001.60$$

9) $1750 is invested in an account earning 13.5% interest compounded monthly for a 2 year period. What is the balance at the end of 9 years?

$$A = 1750\left(1 + \frac{.135}{12}\right)^{12\cdot2}$$
$$A = 1750(1.01125)^{24}$$
$$A = 1750(1.31)$$
$$A = \$2288.98$$

11) A $10, 000 Treasury Bill earned 16% compounded monthly. If the bill matured in 2 years, what was it worth at maturity?

$$A = 10{,}000\left(1 + \frac{.16}{12}\right)^{12\cdot2}$$
$$A = 10{,}000(1.01)^{24}$$
$$A = 10{,}000(1.37)$$
$$A = \$13{,}742.19$$

13) A savings institution advertises 7% annual interest, compounded daily, How much more interest would you earn over the bank savings account or credit union in problems 7 and 8?

$$A = 1000\left(1 + \frac{.07}{365}\right)^{365\cdot10}$$
$$A = 1000(1.00019)^{3650}$$
$$A = 1000(2.01)$$
$$A = \$2013.62$$
$$\#7: 2001.60 - 2013.62 = \$12.02$$
$$\#8: 2009.66 - 2013.62 = \$-3{,}96$$

15) You lend $100 at 10% continuous interest. If you are repaid 2 months later, what is owed?

$$A = 100e^{.1\left(\frac{1}{6}\right)}$$
$$A = 100e^{.0167}$$
$$A = 100(1.02)$$
$$A = \$101.68$$