1. Write the profit function if the cost function is $C(x) = 12x + \frac{8000}{x}$ and the revenue function is $R(x) = 30x$.
   (a) $42x - 8000$  (b) $42x + 8000$  (c) $18x - 8000$  (d) $18x + 8000$
   (e) $36x + 8000$

2. If the profit function is given by $P(x) = 5x - 44$, find the profit from selling 60 items,
   (a) $21$  (b) $256$  (c) $264$  (d) $2860$  (e) $13,200$

3. Find the future value of $1000$ deposited at 8% annual interest and compounded quarterly for 3 years.
   (a) $1000(1.04)^3$  (b) $1000(1.08)^3$  (c) $1000(1.08)^{12}$  (d) $1000(1.02)^3$
   (e) $1000(1.02)^{12}$

4. Find the simple interest on $500$ deposited for 6 months at 9% annual interest.
   (a) $925.93$  (b) $11,111.11$  (c) $270$  (d) $22.50$  (e) $45$

5. How much was borrowed for a loan that yielded $480 in simple interest over 2 years at 10% annual interest?
   (a) $2400$  (b) $340$  (c) $96$  (d) $960$  (e) $4800$

6. Find the effective rate if an annual rate of 6% is compounded semi-annually.
   (a) 42.58%  (b) 6.09%  (c) 12.36%  (d) 12.2%  (e) 3.28%
7. Which formula would find the annual nominal rate, compounded monthly, for an effective rate of 7.763%?

(a) \( P(1.07763) = P(1 + \frac{r}{12}) \)  
(b) \( P(1 + r) = P(1 + \frac{0.07763}{12}) \)

(c) \( P(0.07763) = P(1 + \frac{r}{12})^2 \)  
(d) \( P(1.07763) = P(1 + \frac{r}{12})^2 \)

(e) \( P(1 + r) = P(1 + \frac{0.07763}{12})^2 \)

8. Find the amount in an ordinary annuity after $80 has been deposited monthly for 5 years at an annual rate of 6%.

(a) \( 80 \left[ \frac{(1.06^5 - 1)}{.06} \right] \)  
(b) \( 80 \left[ \frac{(1.005)^{5} - 1}{.005} \right] \)  
(c) \( 80 \left[ \frac{(1.05^{60} - 1)}{.05} \right] \)

(d) \( 80 \left[ \frac{(1.005)^{60} - 1}{.005} \right] \)  
(e) \( 80 \left[ \frac{(1.06)^{12} - 1}{.06} \right] \)

9. At age seven, Betsy Boop starts saving $25 each month in an annuity that pays 8% annual interest. Find the value of her annuity the night before she is 17.

10. Spiderman deposited $5,000 into an account that compounded quarterly. The amount in the account accumulated to $6471.11 over 4 years. What was the annual interest rate?
1. \( P(x) = R(x) - C(x) \)
\[
= 30x - (12x + 2000) \\
= 18x - 2000
\]

2. \( P(60) = 5(60) - 44 \)
\[
= 300 - 44 \\
= 256
\]

3. \( A = P \left( 1 + \frac{r}{m} \right)^{mt} \)
\[
= 1000 \left( 1 + \frac{0.08}{4} \right)^{4.3} \\
= 1000 \left( 1.02 \right)^{12.1}
\]

4. \( I = Prt \)
\[
= 500 \times 6 \times 0.09 \\
= 250 \times 0.09 \\
= 22.50
\]

5. \( A = R \left[ \left( 1 + \frac{i}{m} \right)^{n} - 1 \right] / i \)
\[
= 80 \left[ \left( 1.005 \right)^{60} - 1 \right] / 0.005 \\
= 80 \left[ \left( 1.005 \right)^{60} - 1 \right] / 0.005
\]

6. \( P(1 + \frac{r}{m}t) = P(1 + \frac{r}{m})^{mt} \)
\[
1 + x = (1 + \frac{0.08}{4})^{4.3} \\
1 + x = (1.02)^{12.1} \\
x = 0.0609
\]

7. \( P(1 + rt) = P(1 + \frac{r}{12})^{12t} \)
\[
P(1.0762) = P(1 + \frac{0.08}{12})^{12} \\
\]

8. \( i = \frac{rt}{m} = 0.06 \times \frac{6}{12} = 0.03 \)
\[
A = R \left[ \left( 1 + \frac{0.03}{12} \right)^{12} - 1 \right] / 0.03 \\
= 25 \left[ \left( 1 + \frac{0.03}{12} \right)^{12} - 1 \right] / 0.03 \\
A = 25 \left[ \left( 1 + \frac{0.03}{12} \right)^{12} - 1 \right] / 0.03
\]

9. \( A = \frac{Pm}{i} \left( 1 + \frac{r}{12} \right)^{12} - 1 \)
\[
A = \frac{5000}{0.06} \left( 1 + \frac{0.08}{12} \right)^{12} - 1 \\
A = \frac{5000}{0.06} \left( 1 + \frac{0.08}{12} \right)^{12} - 1 \\
A = \frac{5000}{0.06} \left( 1 + \frac{0.08}{12} \right)^{12} - 1
\]

Acceptable range
\[
54573.65 \text{ to } 54584
\]