Math 121 – Section 5.7 Solutions

3. $100 invested at 4% compounded quarterly after a period of 2 years

$$A = P\left(1 + \frac{r}{n}\right)^{nt}$$

$$A = 100\left(1 + \frac{0.04}{4}\right)^{(4)(2)}$$

$$\boxed{A = \$108.29}$$

7. $600 invested at 5% compounded daily after a period of 3 years

$$A = P\left(1 + \frac{r}{n}\right)^{nt}$$

$$A = 600\left(1 + \frac{0.05}{365}\right)^{(365)(3)}$$

$$\boxed{A = \$697.09}$$

12. $100 invested at 12% compounded continuously after a period of $3\frac{3}{4}$ years

$$A = Pe^{rt}$$

$$A = 100e^{(0.12)(3.75)}$$

$$\boxed{A = \$156.83}$$

13. Find the principal needed now to get $100 after 2 years at 6% compounded monthly.

$$A = P\left(1 + \frac{r}{n}\right)^{nt}$$

$$100 = P\left(1 + \frac{0.06}{12}\right)^{(12)(2)}$$

$$P = \frac{100}{\left(1 + \frac{0.06}{12}\right)^{(12)(2)}}$$

$$\boxed{P = \$88.72}$$

17. Find the principal needed now to get $600 after 2 years at 4% compounded quarterly.

$$A = P\left(1 + \frac{r}{n}\right)^{nt}$$

$$600 = P\left(1 + \frac{0.04}{4}\right)^{(4)(2)}$$

$$P = \frac{600}{\left(1 + \frac{0.04}{4}\right)^{(4)(2)}}$$

$$\boxed{P = \$554.09}$$

20. Find the principal needed now to get \$800 after $2\frac{1}{2}$ years at 8% compounded continuously.

$$A = Pe^{rt}$$
$$800 = Pe^{(0.08)(2.5)}$$
$$P = \frac{800}{e^{(0.08)(2.5)}}$$
$$\boxed{P = \$654.98}$$

27. Find the effective rate of interest for 5% compounded quarterly.

$$r_{\text{eff}} = \frac{A - P}{P}$$
$$r_{\text{eff}} = \left(1 + \frac{r}{n}\right)^{nt} - 1$$
$$r_{\text{eff}} = \left(1 + \frac{0.05}{4}\right)^{(4)(1)} - 1$$
$$\boxed{r_{\text{eff}} = 5.09\%}$$

33. What rate of interest compounded annually is required to triple an investment in 5 years?

$$A = P\left(1 + \frac{r}{n}\right)^{nt}$$
$$3P = P\left(1 + \frac{r}{1}\right)^{(1)(5)}$$
$$3 = (1 + r)^5$$
$$3^{1/5} = 1 + r$$
$$r = 3^{1/5} - 1$$
$$\boxed{r = 24.57\%}$$