

5 You have ~~\$22,500~~ \$18,500 for investment.

a) What is your future value if you invest this money for 5 years at an annual rate 10.5% compounded quarterly?

$$r = \frac{10.5}{100} = .105$$

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

$$S = 18500 \left(1 + \frac{.105}{4}\right)^{4 \times 5}$$

$$= 18500 (1.026)^{20}$$

$$= 31062.408 \$$$

b) How long will it take for your money to grow to \$28,000 in account paying 7.5% compounded continuously

$$t = ??, S = 28000, r = \frac{7.5}{100} = .075$$

$$S = Pe^{rt}$$

$$28000 = 18500 e^{.075t} \rightarrow \frac{28000}{18500} = \frac{18500}{18500} e^{.075t}$$

$$1.5135 = e^{.075t}$$

$$\ln 1.5135 = \ln e^{.075t}$$

$$\ln 1.5135 = .075t (\ln e) \rightarrow 1$$

$$\therefore t = \frac{\ln 1.5135}{.075} = 5.52 \text{ years}$$