

1.5  
39

Find how much is in an account after 1 year if the initial deposit is \$1000 and interest is paid at the rate of 8% compounded

(a) annually

$$F = 1000(1 + 0.08)^1 = 1080$$

In this case \$1080 will be in the account after 1 year

(b) quarterly

$$F = 1000\left(1 + \frac{0.08}{4}\right)^{4(1)} = 1082$$

In this case \$1082 will be in the account after 1 year.

(c) daily

$$F = 1000\left(1 + \frac{0.08}{365}\right)^{365(1)} = 1083.28$$

In this case \$1083.28 will be in the account after 1 year

(f) continuously

$$F = 1000 e^{0.08(1)} = 1083.29$$

In this case \$1083.29 will be in the account after 1 year.

1.5  
45

Find how much we must deposit now so that the value of our account will grow to \$10,000 after 20 years if the annual rate of return is 9% compounded

(b) monthly

$$10,000 = P\left(1 + \frac{0.09}{12}\right)^{12(20)} = P(6.0092)$$

$$\text{So, } P = 1664.13$$

So, we must deposit \$1664.13 to have \$10,000 in 20 years

(d) continuously

$$10000 = P e^{0.09(20)} = P(6.0496)$$

$$\text{So, } P = 1652.99$$

So, in this case we deposit \$1652.99 to have \$10,000 in 20 years.