

Algebra II

10-7a
Compound Interest

Simple Interest

Simple Interest Formula - $I = Prt$, time (years)

Interest \leftarrow I

P \leftarrow Principal - starting value

r \leftarrow rate

Example:

- 1) How much interest is made on a \$5000 account at 1.4% interest in 10 years?

$$I = Prt$$
$$I = 5000(0.014)(10)$$
$$I = \$700$$

Compound Interest Formula

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

A = Amount (Final) r = rate

P = Principal t = time (years)

n = number of compounds/year.

- *1) \$850 is invested at 6% interest compounded quarterly for 15 years. How much is the final investment worth?

$$A = P\left(1 + \frac{r}{n}\right)^{nt}$$
$$A = 850\left(1 + \frac{0.06}{4}\right)^{4(15)}$$
$$A = 850(1.015)^{60}$$
$$A = \$2076.74$$

- *2) If \$1100 is invested at 2.4% interest compounded monthly, how long will it take the investment to triple?

$$A = 3(1100) = \$3300$$

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

$$3300 = 1100\left(1 + \frac{0.024}{12}\right)^{12t}$$

$$\frac{3300}{1100} = \frac{1100(1.002)}{1100}^{12t}$$

$$\ln 3 = \ln 1.002^{12t}$$

$$\frac{\ln 3}{12 \ln 1.002} = \frac{12t \ln 1.002}{12 \ln 1.002}$$

$$t = 45.82 \text{ years}$$

Assignment:
Handout