

Dacia Petric
Math 107
Test 2

03/ /2020

1. How much should you invest for 4 years
6.3% interest compounded continuously
To end up with \$15,000?

$$15000 = P \times e^{.063 \times 4} = P \times e^{0.252}$$
$$= 7610.13 \quad \downarrow P = 1.286596037$$

So $P = 15,000$
 1.286596037
 $= 11658.67$

2. Investment worth \$13,000 in 2010 was worth \$7,500 in 2020.

Find total return on investment = 113.84

The annual return on investment = 9.42%

$$\left(\frac{7,500}{13,000} \right)^{\frac{1}{10}} - 1$$

Annual loss = 9.42%

$$(.5769230)^{\frac{1}{10}} - 1$$

$$.5769230^{\frac{1}{10}}$$
$$0.0576923$$

$$0.05769230 - 1 = -0.9424077$$

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3 What is the APY corresponding to an APR of 7.18% compounded monthly?

$$A = P \times \left(1 + \frac{0.0718}{12}\right)^{12y} = N = 12$$

4.

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5. Saves \$525 for 11 years at 4.5% compounded quarterly

$$\$525 \times \left(1 + \frac{0.045}{4}\right)^{4 \times 11} - 1$$

$$\left(1 + \frac{0.045}{4}\right)^{44} - 1$$

$$\frac{0.045}{4}$$

$$\frac{0.045}{4}$$

$$= 0.01125$$

$$\left(1.01125^{44}\right)$$

$$= \$525 \times 0.635970707$$

$$0.02065$$

$$\begin{array}{r} \$250 \\ \downarrow \\ \$250 \times 30.19761296 \end{array}$$

$$= 16168.75$$

$$50,000 = P \times \frac{(1 + 0.045)^{12 \times 10}}{(1.045)^{120}}$$

$$50,000 = 196.77$$

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7. Monthly payments \$130 for 4 year car loan. How much can she afford to borrow, assuming an APR of 4.5% compounded monthly?

$$130 \times \frac{\frac{0.045}{12}}{1 - \left(1 + \frac{0.045}{12}\right)^{-4 \times 12}}$$

$$1 - (1.00375)^{-4 \times 12}$$

$$1 - (1.00375)^{-4 \times 12}$$

$$1 - 0.8355514597$$

$$= 0.1644485403$$

$$130 \times \frac{0.045 \div 12}{0.1644485403} = 2.96445$$

$$= 2.96445 \quad \boxed{2.96}$$

8.