

save \$1,000,000 by the time he retires at age 65. He is going to invest in a retirement plan that earns 5.2% interest (compounded annually) per year. Calculate how much money Mr. Murphy must save today to reach his retirement goal. You must show all steps that led you to your answer.

years = 40

$$1,000,000 = x \left(1 + \frac{.052}{1}\right)^{40}$$

$$1,000,000 = x(7.59678)$$

$$\$131,634.72 \text{ Initially saved}$$

7. 4. Juan wants to invest \$2,250 in an account that earns 4% interest monthly. How many years will it take for the account to have a value of \$8,000?

$$8000 = 2250 \left(1 + \frac{.04}{12}\right)^{12t}$$

$$3.556 = 1.003^{12t}$$

$$3.4 \text{ years} = t$$

8. You will soon graduate from high school and many of you will graduate from college in the near future. Say you are given a gift of \$5,000 for one of these graduations and wanted to invest this money for the future. Given your knowledge of savings and interest, what type of account would you choose, how long would your money stay in the investment, and what kind of interest could you expect to collect (realistically). Explain your reasoning with complete sentences. (we discussed at length many different options)

9. Elaine wants to have \$50,000 for her child's education. If she begins making contributions to an education annuity paying 10.5% when the child is born, how much must she put in each month to have the desired amount when the child is 18 years old?

$$50,000 = a_1 \frac{(1 - 1.105^{18})}{1 - 1.105}$$

$$-5250 = a_1 (-5.0328)$$

$$a_1 = 1043.1569$$

$$a_1 = \left(\text{sum of yearly pmts}\right) \cdot (\text{Interest})$$

$$1043.16 = x(1.105)$$

$$944.03 = \text{sum of yearly payments}$$

$$\div 12$$

$$= \boxed{\$78.67 \text{ per month}}$$