

**Part II: Examples of Compound Interest (Section 2.4)**

1. You deposit your summer earnings of \$3000 in a C.D. (certificate of deposit) that pays 2% interest compounded quarterly. How much money will in the account after 5 years?

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

$$A = \$3000 \left(1 + \frac{0.02}{4}\right)^{4 \cdot 5}$$

$$A = \$3000 (1 + 0.005)^{20}$$

$$A = \$3000 (1.005)^{20}$$

$$A = \$3000 (1.1049)$$

$$A = \$3314.70$$

2. Donald Trump puts \$100,000 in a C.D. for a grandchild when the child is born. If the C.D. earns 4% interest compounded monthly, and Grandpa Donald writes a check for the child's 25<sup>th</sup> birthday, what will be in the amount of the check in the 25<sup>th</sup> birthday card?

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

$$A = \$100,000 \left(1 + \frac{0.04}{12}\right)^{12 \cdot 25}$$

$$A = \$100,000 (1 + 0.00333)^{300}$$

$$A = \$100,000 (1.00333)^{300}$$

$$A = \$100,000 (2.71106)$$

$$A = \$271,106$$

HAPPY BIRTHDAY!

3. When you were born, your grandparents deposited \$10,000 in a C.D. for your college education. If the account earns 5% interest compounded annually, how much will be in the account for your college education?

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

$$A = \$10,000 \left(1 + \frac{0.05}{1}\right)^{1 \cdot 18}$$

$$A = \$10,000 (1 + 0.05)^{18}$$

$$A = \$10,000 (1.05)^{18}$$

$$A = \$10,000 (2.4066)$$

$$A = \$24,066$$

R.V. ≈ \$20,000 / YEAR

\$61,000 PER YEAR

MIT

4. You deposit \$5000 now for your future child's college education. At 2% interest compounded semi-annually, how much will be in their account when your child is ready for college? Is this smart?

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

$$A = \$5000 \left(1 + \frac{0.02}{2}\right)^{2 \cdot 30}$$

$$A = \$5000 (1 + 0.01)^{60}$$

$$A = \$5000 (1.01)^{60}$$

$$A = \$5000 (1.8167)$$

$$A = \$9083.50$$

\$5000