

# Keystrokes and Answers- Time Value of Money Problems

**Note:** Answers derived by a financial calculator may vary slightly due to rounding. The keystrokes shown below are for a Texas Instruments BA-35 calculator, which can be ordered online from Amazon, ebay, BestBuy, and other vendors. The sequence of data entry will vary among calculators, but the key variables in each calculation are the same.

**1. Amount needed to maintain the purchasing power of a \$32,000 salary at different inflation rates over 20 years:**

$$\text{\$32,000 PV } 3\% i \text{ } 20 N \text{ } FV = \text{\$57,795.56}$$

$$\text{\$32,000 PV } 4\% i \text{ } 20 N \text{ } FV = \text{\$70,115.94}$$

$$\text{\$32,000 PV } 5\% i \text{ } 20 N \text{ } FV = \text{\$84,905.53}$$

**2. Amount required for grandparents to maintain the purchasing power of 2,000 monthly income:**

$$\text{\$2,000 PV } 4\% i \text{ } 10 N \text{ } FV = \text{\$2,960.49}$$

$$\text{\$2,000 PV } 4\% i \text{ } 20 N \text{ } FV = \text{\$4,382.25}$$

$$\text{\$2,000 PV } 4\% i \text{ } 30 N \text{ } FV = \text{\$6,486.80}$$

**3. Present value of uncle's \$25,000 gift to be received in 4 years:**

$$\text{\$25,000 FV } 5\% i \text{ } 4 N \text{ } PV = \text{\$20,567.56}$$

$$\text{\$25,000 FV } 7\% i \text{ } 4 N \text{ } PV = \text{\$19,072.38}$$

$$\text{\$25,000 FV } 10\% i \text{ } 4 N \text{ } PV = \text{\$17,075.34}$$

**4. Comparison of \$6,500 PV to \$10,000 FV in six years:**

$$\text{\$10,000 FV } 5\% i \text{ } 6 N \text{ } PV = \text{\$7,462.15} \text{ OR}$$

$$\text{\$6,500 PV } 5\% i \text{ } 6 N \text{ } FV = \text{\$8,710.62}$$

**5. Value of annual \$3,000 deposits to a IRA for 45 years:**

$$\text{\$3,000 +/-PMT } 4\% i \text{ } 45 N \text{ } FV = \text{\$363,088.17}$$

$$\text{\$3,000 +/-PMT } 7\% i \text{ } 45 N \text{ } FV = \text{\$857,247.93}$$

$$\text{\$3,000 +/-PMT } 9\% i \text{ } 45 N \text{ } FV = \text{\$1,577,576.20}$$

**6. Time required to save \$15,000 with monthly deposits of \$500 at 4% interest:**

$$\text{500 +/- PMT } 4/12 = .33\% i \text{ } FV = \text{\$15,000} \text{ } N = 28.65 \text{ months or } 2.4 \text{ years}$$

**7. Amount of money saved by not smoking over a 35 year period:**

$$\text{2,550 +/- PMT } 10\% i \text{ } 35 N \text{ } FV = \text{\$691,112.14}$$

**8. Lottery decision \$500,000 today vs \$50,000 a year over 20 years:**

$$\text{50,000 +/- PMT } 6\% i \text{ } 20 N \text{ } PV = \text{\$573,496.06}$$

**9. Annual savings to have \$1 million at retirement:**

$$\text{1,000,000 FV } 10\% i \text{ } 40 N \text{ } PMT = 2,259.41$$

$$\text{1,000,000 FV } 10\% i \text{ } 30 N \text{ } PMT = 6,079.25$$

$$\text{1,000,000 FV } 10\% i \text{ } 20 N \text{ } PMT = 17,459.63$$

$$\text{1,000,000 FV } 10\% i \text{ } 10 N \text{ } PMT = 62,745.40$$

**10. How long grandparents' money will last in retirement:**

$$\text{100,000 PV } 7/12 = .58\% i \text{ } 750 \text{ PMT } \text{CPT } N = 256.70 \text{ months or } 21.39 \text{ years}$$