

# Keystrokes and Answers- Time Value of Money Problems

**Note:** Answers derived by a financial calculator may vary slightly due to rounding.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

10. How long grandparents' money will last:

$$100,000 \text{ PV } 7/12 = .58\% \text{ i } 750 \text{ PMT (NO +/- \$ is withdrawn) } \text{CPT N} = 258.60 \text{ months or } 21.55 \text{ years}$$