

# Compound Interest

## Liberal Arts Mathematics

### Assignment Text

The answer the following problems from Section 6.4 of the textbook: 11 - 14, 19 - 22, 35, 37.

For reference, the text of the problems are duplicated below.

In the following exercises, rewrite the percent in decimal form.

11. Principal = \$13,800, annual interest rate = 2.55%, compounded quarterly, for 18 years
12. Principal = \$150,000, annual interest rate = 2.95%, compounded quarterly, for 30 years
13. Principal = \$3,500, annual interest rate = 2.9%, compounded monthly, for 7 years
14. Principal = \$1,500, annual interest rate = 3.23%, compounded monthly, for 30 years.
19. Future value = \$1,500,000, annual interest rate = 4.81%, compounded quarterly, for 35 years
20. Future value = \$750,000, annual interest rate = 3.95%, compounded quarterly, for 10 years
21. Future value = \$600,000, annual interest rate = 3.79%, compounded monthly, for 17 years
22. Future value = \$800,000, annual interest rate = 4.23%, compounded monthly, for 35 years
35. Daria invests \$2,500 in a CD that yields 3.5% compounded quarterly for 5 years. How much is the CD worth after those 5 years?
37. Georgita is shopping for an account to invest her money in. She wants the account to grow to \$400,000 in 30 years. She finds an account that earns 4.75% compounded monthly. How much does she need to deposit to reach her goal?

### Answer Key

- |                  |                  |
|------------------|------------------|
| 11. \$21,806.58  | 19. \$281,395.75 |
| 12. \$362,269.29 | 20. \$506,239.96 |
| 13. \$4,286.70   | 21. \$315,337.97 |
| 14. \$3,947.82   | 22. \$182,493.58 |
|                  | 35. \$2,975.85   |
|                  | 37. \$96,474.38  |

# Student Feedback Templates

#11 should be \$21,806.58 (  $FV = 13800 * ( 1 + 0.0255/4 ) ^ { 18*4 } = 13800*(1.006375)^{72} = 13800*1.58019 = 21806.57911\dots$ , round to 21806.58 )

#12 should be \$362,269.29 (  $FV = 150000 * ( 1 + 0.0295/4 ) ^ { 30*4 } = 150000*(1.007375)^{120} = 150000*2.41513 = 362269.284\dots$ , round to 362269.29 )

#13 should be \$4,286.70 (  $FV = 3500 * ( 1 + 0.029/12 ) ^ { 7*12 } = 3500*(1.002417)^{84} = 3500*1.22477 = 4286.703709\dots$ , round to 4286.70 )

#14 should be \$3,947.82 (  $FV = 1500 * ( 1 + 0.0323 / 12 ) ^ { 30*12 } = 1500*(1.00269)^{360} = 1500*2.63188 = 3947.819223\dots$ , round to 3947.82 )

#19 should be \$281,395.75 (  $PV = 1500000 / ( 1 + 0.0481 / 4 ) ^ { 35*4 } = 1500000/(1.012025)^{140} = 1500000/5.33057 = 281395.7413\dots$ , round up to 281395.75 )

#20 should be \$506,239.96 (  $PV = 750000 / ( 1 + 0.0395 / 4 ) ^ { 10*4 } = 750000/(1.009875)^{40} = 750000/1.48151 = 506239.9538\dots$ , round up to 506239.96 )

#21 should be \$315,337.97 (  $PV = 600000 / ( 1 + 0.0379 / 12 ) ^ { 17*12 } = 600000/(1.00316)^{204} = 600000/1.90272 = 315337.9671\dots$ , round up to 315337.97 )

#22 should be \$182,493.58 (  $PV = 800000 / ( 1 + 0.0423 / 12 ) ^ { 35*12 } = 800000/(1.003525)^{420} = 800000/4.38372 = 182493.5798\dots$ , round up to 182493.58 )

#35 should be \$2,975.85 (  $FV = 2500 * ( 1 + 0.035 / 4 ) ^ { 5*4 } = 2500*(1.00875)^{20} = 2500*1.19034 = 2975.849498\dots$ , round to 2975.85 )

#37 should be \$96,474.38 (  $PV = 400000 / ( 1 + 0.0475 / 12 ) ^ { 30*12 } = 400000/(1.00396)^{360} = 400000/4.14618 = 96474.37598\dots$ , round up to 96474.38).