Compound Interest

Unit: Comparing Quantities - Student Practice Worksheet

Overview: Meera invested Rs. 10,000 at 10% for 2 years. Arjun computed simple interest and got Rs. 2,000. Meera's bank statement showed Rs. 2,100. The extra Rs. 100 wasn't a bank error — it was interest earning interest.

Practice Questions (30 Total)

Section A - Easy

Q1. Teal 1000 plus a 10% maroon strip for 1 year. Amount?

1000 at 10% for 1 year

- ☐ **A.** Rs. 1,010
- ☐ **B.** Rs. 1,200
- ☐ **C.** Rs. 1,100
- ☐ **D.** Rs. 1,000

Q2. What is the compound interest formula for Amount?

- ☐ **A.** A = P(1 + R/100)■
- ☐ **B.** A = P + RT/100
- ☐ **C.** A = PRT/100
- ☐ **D.** A = P × R × n

Q3. Under compound interest, is each year's interest amount the same?

- ☐ **A.** Yes, always the same
- ☐ **B.** No, it grows each year
- ☐ **C.** No, it shrinks each year
- ☐ **D.** Only for the first year

Q4. Two stacked years at 10% on 1000. Amount after 2 years?

2 years at 10%

- [ ] **A.** Rs. 1,200
- [ ] **B.** Rs. 1,100
- [ ] **C.** Rs. 1,220
- [ ] **D.** Rs. 1,210

Q5. What does 'n' represent in the compound interest formula?

- [ ] **A.** The interest rate
- [ ] **B.** The principal amount
- [ ] **C.** The number of compounding periods
- [ ] **D.** The final amount

Q6. Rs. 2,000 is invested at 5% per year, compounded annually, for 1 year. Find the CI.

- [ ] **A.** Rs. 200
- [ ] **B.** Rs. 50
- [ ] **C.** Rs. 2,100
- [ ] **D.** Rs. 100

Q7. Teal 500 plus a 20% maroon strip for 1 year. Amount?

500 at 20% for 1 year

- [ ] **A.** Rs. 520
- [ ] **B.** Rs. 600
- [ ] **C.** Rs. 100
- [ ] **D.** Rs. 550

Q8. What is CI in terms of Amount and Principal?

- [ ] **A.** CI = Amount – Principal
- [ ] **B.** CI = Amount + Principal
- [ ] **C.** CI = Amount × Principal
- [ ] **D.** CI = Principal – Amount

Q9. For the same P, R, T (positive rate), which is generally larger: CI or SI?

- A. SI is always larger
- B. CI is always larger or equal
- C. They are always exactly equal
- D. Neither can be compared

Q10. Is each year's CI taken on the original principal, and why not?

- A. No, on the growing accumulated amount
- B. Yes, always
- C. Only in year 1
- D. Only in the final year

Section B - Medium

Q11. 10000 grown by 1.10 squared. Amount after 2 years?

$$10000 \rightarrow \times 1.10^2$$

- A. Rs. 12,100
- B. Rs. 12,000
- C. Rs. 11,000
- D. Rs. 12,200

Q12. If a sum doubles in value under compound interest after n years, what does A = P(1+R/100)■ tell you about the ratio A/P?

- A. A/P = 1
- B. A/P = n
- C. A/P = R
- D. A/P = 2

Q13. Find the CI on Rs. 8,000 at 5% per year, compounded annually, for 3 years.

- A. Rs. 1,200
- B. Rs. 1,261
- C. Rs. 1,250

- [ ] **D.** Rs. 1,000

Q14. 15000 grown by 1.08 squared. Amount after 2 years?

$$15000 \rightarrow \times 1.08^2$$

- [ ] **A.** Rs. 17,400
- [ ] **B.** Rs. 16,200
- [ ] **C.** Rs. 17,600
- [ ] **D.** Rs. 17,496

Q15. For a 1-year deposit, is compound interest ever different from simple interest?

- [ ] **A.** Yes, CI is always higher
- [ ] **B.** No, they're always identical for exactly 1 year
- [ ] **C.** Yes, SI is always higher
- [ ] **D.** It depends on the rate

Q16. Compare CI and SI on Rs. 8,000 at 5% per year for 3 years. What is the difference between them?

- [ ] **A.** Rs. 100
- [ ] **B.** Rs. 200
- [ ] **C.** Rs. 61
- [ ] **D.** Rs. 1

Q17. 12000 at 10% for 2 years. Compound interest, not the amount?

12000, 10%, 2 years

- [ ] **A.** Rs. 2,520
- [ ] **B.** Rs. 2,400
- [ ] **C.** Rs. 2,200
- [ ] **D.** Rs. 1,200

Q18. Find the compound interest on Rs. 20,000 at 10% per year, compounded annually, for 1 year, and compare it to the simple interest for the same period.

- [ ] **A.** CI is Rs. 2,200, SI is Rs. 2,000
- [ ] **B.** Both equal Rs. 2,000
- [ ] **C.** CI is Rs. 2,000, SI is Rs. 2,200
- [ ] **D.** Both equal Rs. 2,200

Q19. Find the amount on Rs. 6,000 at 4% per year, compounded annually, for 2 years.

- [ ] **A.** Rs. 6,480
- [ ] **B.** Rs. 6,240
- [ ] **C.** Rs. 6,489.60
- [ ] **D.** Rs. 6,500

Q20. 4000 grows to 4410 in 2 years. Find R from the square root of A/P.

- [ ] **A.** 5%
- [ ] **B.** 10%
- [ ] **C.** 2.5%
- [ ] **D.** 7.5%

Section C - Challenge

Q21. 10000 at 10% per year, compounded half-yearly for 1 year. Amount?

H1: 5%

H2: 5%

- [ ] **A.** Rs. 11,025
- [ ] **B.** Rs. 11,000
- [ ] **C.** Rs. 11,100
- [ ] **D.** Rs. 10,500

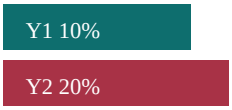
Q22. A sum P grows to A1 after 2 years and to A2 after 3 years under the same compound rate. Express the rate R using A1 and A2 only.

- [ ] **A.** R = (A2 – A1)
- [ ] **B.** R = (A2/A1) × 100
- [ ] **C.** R = ((A2/A1) – 1) × 100
- [ ] **D.** R = A2 – A1 × 100

Q23. A sum invested at compound interest amounts to Rs. 9,261 after 3 years at 5% per year. Find the original principal.

- [ ] **A.** Rs. 8,500
- [ ] **B.** Rs. 8,000
- [ ] **C.** Rs. 7,500
- [ ] **D.** Rs. 9,000

Q24. 5000: year 1 at 10%, year 2 at 20%. Amount after 2 years?



- [ ] **A.** Rs. 6,050
- [ ] **B.** Rs. 6,500
- [ ] **C.** Rs. 7,000
- [ ] **D.** Rs. 6,600

Q25. For a 3-year investment, is the ratio of CI to SI on the same principal and rate always exactly the same regardless of the rate value?

- [ ] **A.** No, the ratio changes with the rate
- [ ] **B.** Yes, always exactly the same ratio
- [ ] **C.** Yes, but only for whole-number rates
- [ ] **D.** The ratio is always exactly 1

Q26. The difference between CI and SI on a sum for 2 years at 8% per year is Rs. 64. Find the principal.

- [ ] **A.** Rs. 8,000
- [ ] **B.** Rs. 6,400
- [ ] **C.** Rs. 10,000
- [ ] **D.** Rs. 5,000

Q27. 20000 grows to 24200 in 2 years. Annual rate R?

- [ ] **A.** 8%
- [ ] **B.** 10%
- [ ] **C.** 12%
- [ ] **D.** 5%

Q28. Rs. 15,000 amounts to Rs. 19,965 in 3 years under compound interest at a fixed annual rate. Verify: is the rate closest to 10%?

- [ ] **A.** No, the rate is 15%
- [ ] **B.** No, the rate is 20%
- [ ] **C.** No, the rate is 5%
- [ ] **D.** Yes, $19965/15000=1.331=1.1^3$

Q29. A sum is invested at 10% per year, compounded annually. After how many full years will it first exceed double the original principal?

- [ ] **A.** 7 years
- [ ] **B.** 8 years
- [ ] **C.** 10 years
- [ ] **D.** 5 years

Q30. A sum doubles in 5 years under CI. After 10 years at the same rate, how many times the original?

- [ ] **A.** 4 times the original, not merely 3 times
- [ ] **B.** Exactly 3 times the original
- [ ] **C.** Exactly 2 times the original
- [ ] **D.** Exactly 2.5 times the original

Answer Key

Q1: (C) (c) Rs. 1,100. A = 1000×1.10 = 1100.

Q2: (A) (a) A = P(1 + R/100)■. Principal times one plus the rate fraction, raised to the number of periods.

Q3: (B) (b) No, it grows each year. Each year's interest is calculated on the larger accumulated amount.

Q4: (D) (d) Rs. 1,210. A = $1000\times1.10^2 = 1000\times1.21 = 1210$.

Q5: (C) (c) The number of compounding periods. Usually the number of years, for annual compounding.

Q6: (D) (d) Rs. 100. A=2000×1.05=2100, CI=2100–2000=100.

Q7: (B) (b) Rs. 600. A = 500×1.20 = 600.

Q8: (A) (a) CI = Amount – Principal. The interest is the total growth over the original sum.

Q9: (B) (b) CI is always larger or equal. Compounding lets interest earn interest, which SI never does.

Q10: (A) (a) No, on the growing accumulated amount. This is what distinguishes compound from simple interest.

Q11: (A) (a) Rs. 12,100. A = 10000×1.10^2=10000×1.21=12100.

Q12: (D) (d) A/P = 2. Doubling means the final amount is exactly twice the principal, so the ratio is 2.

Q13: (B) (b) Rs. 1,261. A=8000×1.05^3=8000×1.157625=9261, CI=9261–8000=1261.

Q14: (D) (d) Rs. 17,496. A=15000×1.08^2=15000×1.1664=17496.

Q15: (B) (b) No, they're always identical for exactly 1 year. The compounding effect only shows up from the second period onward.

Q16: (C) (c) Rs. 61. CI=1261 (from M2), SI=(8000×5×3)/100=1200, difference=1261–1200=61.

Q17: (A) (a) Rs. 2,520. A=12000×1.21=14520, CI=14520–12000=2520.

Q18: (B) (b) Both equal Rs. 2,000. For exactly 1 year, CI and SI are always identical, since compounding hasn't had a chance to apply yet.

Q19: (C) (c) Rs. 6,489.60. A=6000×1.04^2=6000×1.0816=6489.60.

Q20: (A) (a) 5%. 4410/4000=1.1025, and $\sqrt{1.1025}=1.05$, so R=5%.

Q21: (A) (a) Rs. 11,025. Half-yearly rate=5%, periods=2: A=10000×1.05^2=10000×1.1025=11025 — compounding more often gives slightly more than annual compounding's Rs. 11,000.

Q22: (C) (c) R = ((A2/A1) – 1) × 100. The ratio of consecutive years' amounts is exactly (1+R/100), since one more year of compounding is applied.

Q23: (B) (b) Rs. 8,000. P = $9261/1.05^3$ = 9261/1.157625 = 8000.

Q24: (D) (d) Rs. 6,600. Year 1: 5000×1.10=5500. Year 2: 5500×1.20=6600.

Q25: (A) (a) No, the ratio changes with the rate. A higher rate produces a proportionally bigger compounding effect, so the CI/SI ratio grows with the rate, not staying fixed.

Q26: (C) (c) Rs. 10,000. For 2 years, the CI-SI difference equals $P\times(R/100)^2$, so $P\times0.0064=64$, giving $P=10000$.

Q27: (B) (b) 10%. $24200/20000=1.21$, $\sqrt{1.21}=1.1$, so $R=10\%$.

Q28: (D) (d) Yes, $19965/15000=1.331=1.1^3$. $1.1^3=1.331$ exactly, confirming a 10% annual rate over 3 years.

Q29: (B) (b) 8 years. 1.1■≈1.949 (not yet double), 1.1■≈2.144 (exceeds double) — so year 8 is the first year the amount exceeds twice the principal.

Q30: (A) (a) 4 times the original, not merely 3 times. Doubling again over the next 5 years multiplies by 2 a second time: $2\times2=4$, since compound growth is exponential, not linear — a common mistake is assuming two doubling periods only triple the sum.

You've got this! Keep learning and shining! - Ruchi Math Coaching