Part 1: Meaning of Rounding Off & Number Line Concept (सन्निकटन का अर्थ) — Basics

1.1 Why Do We Round Off? In daily life (news headlines, crowd counts, distances, budgets), exact figures are often replaced by nearby round numbers that are easy to remember and calculate. Replacing a number with its nearest multiple of 10, 100, 1000, etc., is called **Rounding Off (सन्निकटन)**.

सन्निकटन क्यों करते हैं? दैनिक जीवन में बड़ी संख्याओं को याद रखने और त्वरित गणना करने के लिए उन्हें निकटतम 10, 100 या 1000 के गुणज में बदला जाता है, जिसे सन्निकटन कहते हैं।

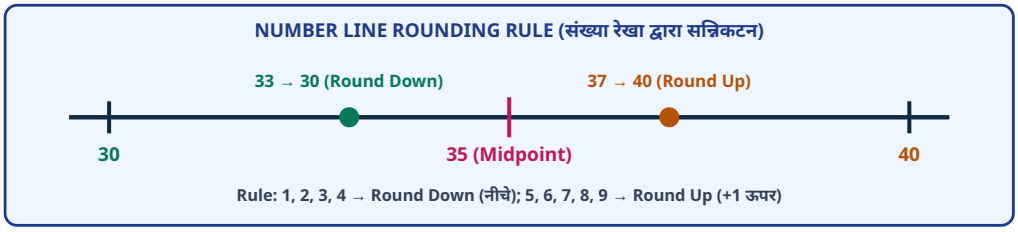


Figure 1: Visualizing Rounding Off on a Number Line (संख्या रेखा पर सन्निकटन)

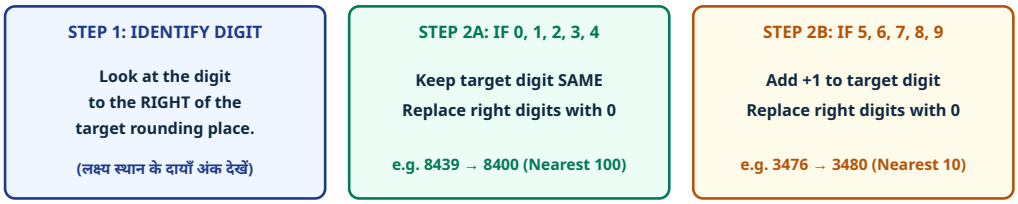


Figure 2: Two-Step Rounding Decision Chart (सन्निकटन की दो-चरणीय विधि)

Example 1: Round off 64 and 65 to the nearest ten.
Solution: In 64, ones digit is 4 (< 5) ⇒ **60**. In 65, ones digit is 5 (≥ 5) ⇒ **70**.

64 का इकाई अंक 4 (< 5) ⇒ **60**; 65 का इकाई अंक 5 (≥ 5) ⇒ **70**।

Example 2: Round off 748 and 752 to the nearest hundred.
Solution: In 748, tens digit is 4 (< 5) ⇒ **700**. In 752, tens digit is 5 (≥ 5) ⇒ **800**.

748 में दहाई 4 ⇒ **700**; 752 में दहाई 5 ⇒ **800**।

Example 3: Round off 4,390 and 4,500 to the nearest thousand.
Solution: In 4,390, hundreds digit is 3 (< 5) ⇒ **4,000**. In 4,500, hundreds digit is 5 (≥ 5) ⇒ **5,000**.

4,390 → **4,000** तथा 4,500 → **5,000**।

Part 2: Rounding Large Numbers (Ten-Thousands, Lakhs & Crores) — Large Numbers

2.1 Indian Place Value Rounding: Always identify the target place carefully:
• **Nearest 10,000:** Check the Thousands digit.
• **Nearest Lakh (1,00,000):** Check the Ten-Thousands digit.
• **Nearest 10 Lakh:** Check the Lakhs digit.
• **Carry-Over Rule:** When adding +1 to a 9, it becomes 10 and carries 1 to the left (e.g., 9,998 to nearest 10 = 10,000).

बड़ी संख्याओं का सन्निकटन: 10,000 के लिए हज़ार का अंक, लाख के लिए दस हज़ार का अंक जाँचें। यदि 9 में +1 जोड़ना पड़े, तो हासिल बाईं ओर चला जाता है।

Example 4: Round off 53,489 to the nearest ten-thousand.
Solution: Thousands digit is 3 (< 5) ⇒ **50,000**.

हज़ार का अंक 3 है, अतः **50,000**।

Example 5: Round off 6,72,410 to the nearest lakh.
Solution: Ten-thousands digit is 7 (≥ 5) ⇒ 6 + 1 = 7 ⇒ **7,00,000**.

दस हज़ार का अंक 7 (≥ 5) है, अतः **7,00,000**।

Example 6: Round off 99,996 to the nearest ten.
Solution: Ones digit is 6 (≥ 5). Add 1 to 99,99 tens ⇒ 10,000 tens = **1,00,000**.

इकाई 6 (≥ 5) होने से +1 जुड़कर **1,00,000** प्राप्त होगा।

Example 7: Round off 4,85,290 to the nearest thousand, ten-thousand, and lakh.
Solution: Nearest 1,000 = **4,85,000**; Nearest 10,000 = **4,90,000**; Nearest Lakh = **5,00,000**.

निकटतम हज़ार = 4,85,000; दस हज़ार = 4,90,000; लाख = 5,00,000।

Part 3: Rounding Decimals (दशमलव संख्याओं का सन्निकटन) — Decimal Rules

3.1 Decimal Rounding Rule:
• **Nearest Whole Number:** Check the 1st digit after decimal (tenths place). Drop all decimal digits after rounding.
• **Nearest Tenth (1 decimal place):** Check the 2nd digit after decimal (hundredths place).
• **Nearest Hundredth (2 decimal places):** Check the 3rd digit after decimal (thousandths place).

दशमलव सन्निकटन: पूर्ण संख्या हेतु दशमलव के बाद पहला अंक, 1 दशमलव स्थान हेतु दूसरा अंक, और 2 दशमलव स्थान हेतु तीसरा अंक देखें।

Example 8: Round off 27.49 and 27.51 to the nearest whole number.
Solution: 27.49 → **27** (tenths 4 < 5); 27.51 → **28** (tenths 5 ≥ 5).

27.49 → **27** और 27.51 → **28**।

Example 9: Round off 6.847 to one decimal place (nearest tenth).
Solution: Hundredths digit is 4 (< 5) ⇒ **6.8**.

दूसरे दशमलव अंक 4 (< 5) के कारण **6.8**।

Example 10: Round off 14.376 to two decimal places (nearest hundredth).
Solution: Thousandths digit is 6 (≥ 5) ⇒ 7 + 1 = 8 ⇒ **14.38**.

तीसरे अंक 6 (≥ 5) के कारण **14.38**।

Example 11: Round off 9.996 to two decimal places.
Solution: Thousandths digit 6 (≥ 5) adds 0.01 to 9.99 ⇒ **10.00**.

9.99 + 0.01 = **10.00**।

Part 4: Estimating Sums & Differences (योग व अंतर का आकलन) — Operations

4.1 General Rule for Addition & Subtraction: Round off each number to the same suitable place (usually the greatest place of the smaller number, or as specified in the question), then add or subtract.

योग और अंतर के आकलन के लिए प्रश्न में बताए गए स्थान (या छोटी संख्या के अधिकतम स्थान) तक सन्निकटन करके जोड़ या घटाव करें।

Example 12: Estimate 5,290 + 17,986 by rounding to the nearest thousand.
Solution: 5,290 → 5,000; 17,986 → 18,000. Estimated sum = 5,000 + 18,000 = **23,000**.

5,000 + 18,000 = **23,000**।

Example 13: Estimate 5,673 − 436 using the general rule.
Solution: Round 5,673 to nearest thousand (6,000) or both to nearest hundred (5,700 − 400 = **5,300** — more accurate!).

सैकड़े तक सन्निकटन करने पर 5,700 − 400 = **5,300**।

Example 14: Estimate 8325 − 491 to the nearest hundred.
Solution: 8325 → 8300; 491 → 500. Difference = 8300 − 500 = **7,800**.

8300 − 500 = **7,800**।

Example 15: Estimate the sum of 439 + 334 + 4,317 to the nearest hundred.
Solution: 400 + 300 + 4,300 = **5,000**.

400 + 300 + 4,300 = **5,000**।

Example 16: Estimate 1,08,734 − 47,599 to the nearest ten-thousand.
Solution: 1,10,000 − 50,000 = **60,000**.

1,10,000 − 50,000 = **60,000**।

Part 5: Estimating Products & Quotients (गुणनफल व भागफल का आकलन) — Speed Math

5.1 Product Estimation (General Rule): Round off each factor to its greatest place, then multiply.
Example: 5281 × 3491 → 5000 × 3000 = 1,50,00,000.
5.2 Quotient Estimation (Compatible Numbers): Round the divisor to its greatest place (e.g. nearest 10), then round the dividend to the nearest multiple of that rounded divisor!

गुणनफल में प्रत्येक संख्या को उसके सबसे बड़े स्थान तक सन्निकट करें। भाग में भाजक को निकटतम 10 तक सन्निकट करके भाज्य को उसके निकटतम गुणज में बदलें।

Example 17: Estimate 87 × 313 using the general rule.
Solution: 87 → 90 (nearest 10); 313 → 300 (nearest 100). Product = 90 × 300 = **27,000**.

90 × 300 = **27,000**।

Example 18: Estimate 9 × 795.
Solution: Keep single-digit 9 as 9 (or round to 10); 795 → 800. 9 × 800 = **7,200** (or 10 × 800 = 8,000).

9 × 800 = **7,200**।

Example 19: Estimate 9,250 × 29.
Solution: 9,250 → 9,000; 29 → 30. Product = 9,000 × 30 = **2,70,000**.

9,000 × 30 = **2,70,000**।

Example 20: Estimate the quotient: 868 ÷ 38.
Solution: 38 → 40; 868 → 880 (multiple of 40) or 900. 880 ÷ 40 = **22** (or 800 ÷ 40 = 20).

880 ÷ 40 = **22**।

Example 21: Estimate 2,418 ÷ 58.
Solution: 58 → 60; 2,418 → 2,400. Quotient = 2,400 ÷ 60 = **40**.

2,400 ÷ 60 = **40**।

Part 6: Range of Rounding & Reverse Rounding Problems (सीमा व विपरीत प्रश्न) — RMS Favorites

6.1 Finding Smallest & Greatest Numbers for a Rounded Value R:
• Nearest **10**: Range is **[R − 5, R + 4]** (10 numbers).
• Nearest **100**: Range is **[R − 50, R + 49]** (100 numbers).
• Nearest **1,000**: Range is **[R − 500, R + 499]** (1,000 numbers).

किसी सन्निकट मान R के लिए: निकटतम 10 हेतु सीमा [R−5 से R+4], निकटतम 100 हेतु [R−50 से R+49], और निकटतम 1000 हेतु [R−500 से R+499] होती है।

Example 22: Write the smallest and greatest numbers that round to 400 (nearest 100).
Solution: Smallest = 400 − 50 = **350**; Greatest = 400 + 49 = **449**.

सबसे छोटी = **350**, सबसे बड़ी = **449**।

Example 23: How many whole numbers round to 9,000 when rounded to the nearest thousand?
Solution: From 8,500 to 9,499 ⇒ 9,499 − 8,500 + 1 = **1,000 numbers**.

8,500 से 9,499 तक कुल **1,000 संख्याएँ**।

Example 24: Find the sum of the smallest and greatest numbers that round to 80 (nearest 10).
Solution: Smallest = 75, Greatest = 84. Sum = 75 + 84 = **159**.

75 + 84 = **159**।

Part 7: Word Problems & Daily Life Estimation (व्यावहारिक आकलन समस्याएँ) — Word Problems

Example 25: A school has 1,248 boys and 963 girls. Estimate total students to the nearest hundred.
Solution: 1,248 → 1,200; 963 → 1,000. Total ≈ **2,200 students**.

1,200 + 1,000 = **2,200 विद्यार्थी**।

Example 26: One chair costs ₹485. Estimate the cost of 39 chairs.
Solution: 485 → 500; 39 → 40. Cost ≈ 500 × 40 = **₹20,000**.

500 × 40 = **₹20,000**।

Example 27: A car travels 612 km using 49 litres of petrol. Estimate its mileage (km/litre).
Solution: 612 → 600; 49 → 50. Mileage ≈ 600 ÷ 50 = **12 km/litre**.

600 ÷ 50 = **12 किमी/लीटर**।

Example 28: Round off the population of a city 45,68,210 to the nearest lakh and nearest ten-lakh.
Solution: Nearest Lakh = **46,00,000**; Nearest Ten-Lakh = **50,00,000**.

निकटतम लाख = 46,00,000; दस लाख = 50,00,000।

Example 29: Estimate the difference between 78,432 and 24,890 to the nearest thousand.
Solution: 78,000 − 25,000 = **53,000**.

78,000 − 25,000 = **53,000**।

Example 30: Round off 0.0875 to three decimal places.
Solution: 4th decimal digit is 5 (≥ 5) ⇒ **0.088**.

चौथा अंक 5 होने से **0.088**।

Example 31: Round off ₹148.45 to the nearest rupee.
Solution: Tenths digit is 4 (< 5) ⇒ **₹148**.

दशमलव के बाद पहला अंक 4 (< 5) है, अतः **₹148**।

Example 32: Which digit can replace * in 4*8 so that it rounds to 500 (nearest 100)?
Solution: Tens digit * must be ≥ 5, so * can be **5, 6, 7, 8, or 9**.

दहाई का अंक * 5 या उससे बड़ा होना चाहिए (5, 6, 7, 8, 9)।

Part 8: Quick-Reference Practice Matrix & Extra Drills (त्वरित अभ्यास तालिका) Speed Booster

Number	Nearest 10	Nearest 100	Nearest 1,000
3,476	3,480	3,500	3,000
8,439	8,440	8,400	8,000
46,782	46,780	46,800	47,000
9,99,510	9,99,510	9,99,500	10,00,000

Example 33: Estimate 498 × 21 using nearest hundred and nearest ten.
Solution: 500 × 20 = **10,000**.

500 × 20 = **10,000**।

Example 34: Estimate 1,520 ÷ 49.
Solution: 1,500 ÷ 50 = **30**.

1,500 ÷ 50 = **30**।

Example 35: Find the difference between actual sum (48 + 73) and estimated sum (nearest 10).
Solution: Actual = 121; Estimated = 50 + 70 = 120. Difference = **1**.

वास्तविक = 121, अनुमानित = 120; अंतर = **1**।

Example 36: Round off 65,432 to the nearest ten-thousand.
Solution: Thousands digit is 5 (≥ 5) ⇒ **70,000**.

हज़ार का अंक 5 है, अतः **70,000**।

Target Rounded Value	Smallest Whole Number	Greatest Whole Number	Total Whole Numbers
Nearest 10 = **40**	35	44	10
Nearest 100 = **500**	450	549	100

Target Rounded Value	Smallest Whole Number	Greatest Whole Number	Total Whole Numbers
Nearest 1,000 = **8,000**	7,500	8,499	1,000
Nearest 10,000 = **30,000**	25,000	34,999	10,000

Example 37: Round off 99.95 to one decimal place.
Solution: Hundredths digit is 5 (≥ 5), so 99.9 + 0.1 = **100.0**.

दूसरा अंक 5 होने से 99.9 + 0.1 = **100.0**।

Example 38: Estimate 3,924 + 5,180 to the nearest hundred.
Solution: 3,900 + 5,200 = **9,100**.

3,900 + 5,200 = **9,100**।

Example 39: Estimate 7,892 − 2,340 to the nearest thousand.
Solution: 8,000 − 2,000 = **6,000**.

8,000 − 2,000 = **6,000**।

Example 40: A stadium holds 48,720 spectators. Round this capacity to the nearest thousand.
Solution: Hundreds digit is 7 (≥ 5) ⇒ **49,000**.

सैकड़े का अंक 7 है, अत: **49,000**।

Example 41: Find the product of the smallest and greatest numbers that round to 20 (nearest 10).
Solution: Smallest = 15, Greatest = 24. Product = 15 × 24 = **360**.

15 × 24 = **360**।

Example 42: Estimate 4,812 ÷ 79 using compatible numbers.
Solution: 79 → 80; 4,812 → 4,800. Quotient = 4,800 ÷ 80 = **60**.

4,800 ÷ 80 = **60**।

TYBA Master Checklist for RMS CET: (1) Always check the digit to the RIGHT of the target place. (2) Remember 5 rounds UP (+1). (3) For range questions, remember [R−50, R+49] for nearest 100. (4) For division estimation, use compatible multiples!