Chapter 9: House of Hundreds - II

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Exercise 9.1 — Let us Do — Number of Rice Sacks

Q1 Draw tiles to show the following numbers. (a) 832 (b) 947 (c) 726 (d) 504 (e) 620 (f) 700

SOLUTION

Each number is broken into hundreds (large tile), tens (medium tile), and ones (small tile).
(a) 832 = 8 hundreds, 3 tens, 2 ones → draw 8 hundred-tiles, 3 ten-tiles, 2 one-tiles.
(b) 947 = 9 hundreds, 4 tens, 7 ones → draw 9 hundred-tiles, 4 ten-tiles, 7 one-tiles.
(c) 726 = 7 hundreds, 2 tens, 6 ones → draw 7 hundred-tiles, 2 ten-tiles, 6 one-tiles.
(d) 504 = 5 hundreds, 0 tens, 4 ones → draw 5 hundred-tiles, no ten-tiles, 4 one-tiles.
(e) 620 = 6 hundreds, 2 tens, 0 ones → draw 6 hundred-tiles, 2 ten-tiles, no one-tiles.
(f) 700 = 7 hundreds, 0 tens, 0 ones → draw 7 hundred-tiles only.
Drawing activity. Each number is represented using flat tiles: a large square = 100 (hundred-tile), a horizontal rectangle = 10 (ten-tile), a small square = 1 (one-tile). (a) 832 = draw 8 hundred-tiles, 3 ten-tiles, 2 one-tiles. (b) 947 = 9 hundred-tiles, 4 ten-tiles, 7 one-tiles. (c) 726 = 7 hundred-tiles, 2 ten-tiles, 6 one-tiles. (d) 504 = 5 hundred-tiles, 0 ten-tiles, 4 one-tiles. (e) 620 = 6 hundred-tiles, 2 ten-tiles, 0 one-tiles. (f) 700 = 7 hundred-tiles, 0 ten-tiles, 0 one-tiles.

Q2 Locate the following numbers on the number line: 530, 540, 628, 696, 590. (Number line from 500 to 700.)

SOLUTION

The number line runs from 500 to 700 with marked points at 500, 520, 560, 600, 620, 660, 680, 700.
530 lies between 520 and 560, halfway between 520 and 540.

540 lies between 520 and 560, closer to 560.
590 lies between 560 and 600, close to 600.
628 lies between 620 and 660, just after 620.
696 lies between 680 and 700, close to 700.
Number line from 500 to 700 has marked points at 500, 520, 560, 600, 620, 660, 680, 700 (each interval = 20). Placements: 530 → between 520 and 560, closer to 520; 540 → between 520 and 560, closer to 560; 590 → between 560 and 600, close to 600; 628 → between 620 and 660, just after 620; 696 → between 680 and 700, very close to 700.

Q3 Locate the following numbers on the number line: 703, 721, 759, 810, 855, 887. (Number line from 695 to 875.)

SOLUTION

The number line runs from 695 to 875 with marks at 695, 715, 735, 775, 795, 835, 855, 875.
703 lies between 695 and 715, close to 695.
721 lies between 715 and 735, just after 715.
759 lies between 735 and 775, close to 760.
810 lies between 795 and 835, just after 795.
855 lies on the marked point 855.
887 lies between 875 and the next mark, just after 875.
Number line from 695 to 875 has marked points at 695, 715, 735, 775, 795, 835, 855, 875 (each interval = 20). Placements: 703 → between 695 and 715, close to 695; 721 → between 715 and 735, just after 715; 759 → between 735 and 775, close to the midpoint; 810 → between 795 and 835, just after 795; 855 → exactly on the marked point 855; 887 → beyond 875, in the blank box at the right end of the line.

Exercise 9.2 — Let us Think — Neighbouring Numbers

Q1 Write the appropriate numbers between which each of the given numbers lie. Fill in neighbouring hundreds, neighbouring fifties, and neighbouring tens for: 183, 345, 693, 734, 899. (Example given: 468 lies between 400 and 500 (hundreds), 450 and 500 (fifties), 460 and 470 (tens).)

SOLUTION

183: Hundreds → 183 is between 100 and 200. Fifties → between 150 and 200. Tens → between 180 and 190.
345: Hundreds → 345 is between 300 and 400. Fifties → between 300 and 350. Tens → between 340 and 350.
693: Hundreds → 693 is between 600 and 700. Fifties → between 650 and 700. Tens → between 690 and 700.
734: Hundreds → 734 is between 700 and 800. Fifties → between 700 and 750. Tens → between 730 and 740.
899: Hundreds → 899 is between 800 and 900. Fifties → between 850 and 900. Tens → between 890 and 900.
183: H=100–200, 50s=150–200, 10s=180–190 | 345: H=300–400, 50s=300–350, 10s=340–350 | 693: H=600–700, 50s=650–700, 10s=690–700 | 734: H=700–800, 50s=700–750, 10s=730–740 | 899: H=800–900, 50s=850–900, 10s=890–900

Q2 Help cranes reach their food using the number line. (a) Length of steps = 5. To reach the fish: 667 + __ steps = 700. To reach the worm: 667 – __ steps = 650. (b) Second number line: __ + __ steps = 800. __ – __ steps = 750.

SOLUTION

(a) Step length on this number line: the marks go 650, 655, 660, 665, 670, 675, 680 … each step = 5.
To reach the fish at 700: 700 – 667 = 33. So 667 + 33 steps (of size 1 each) OR 667 needs 33 more.
But counting in steps of 5: 667 is between 665 and 670; to reach 700 needs 33 more.
To reach the worm at 650: 667 – 650 = 17. So 667 – 17 = 650.
(b) The second number line has marks 750, 755, 760, …, 800; each step = 5.
If the crane is at 755: 755 + 45 = 800 (45 steps of 1, or 9 steps of 5). 755 – 5 = 750.
Children may use different starting points; any correct addition and subtraction reaching 800 and 750 is acceptable.
(a) 667 + 33 = 700; 667 – 17 = 650. (b) Answers vary by starting position; step length = 5.

Exercise 9.3 — Let us Think — Tambola

Q1 Fill the grid with numbers between 570 and 630. Strike out numbers matching the clues: 1. A number with 4 as a digit. 2. Numbers between 595 and 605. 3. A number with 1 as the tens digit. 4. Two more than 610. 5. Five less than 625.

SOLUTION

Clue 1 — numbers containing digit 4: 574, 584, 594, 604, 614, 624.
Clue 2 — numbers between 595 and 605 (exclusive): 596, 597, 598, 599, 600, 601, 602, 603, 604.
Clue 3 — tens digit = 1: 610, 611, 612, 613, 614, 615, 616, 617, 618, 619.
Clue 4 — two more than 610: 610 + 2 = 612.
Clue 5 — five less than 625: 625 – 5 = 620.
Strike out every number in your grid that matches any clue. Numbers matching multiple clues (e.g., 614 matches clues 1 and 3) count as one strikeout.
Clue 4 → 612; Clue 5 → 620. Clue 1 → all grid numbers containing digit 4. Clue 2 → grid numbers 596–604. Clue 3 → grid numbers 610–619.

Q2 Write different ways of making: 368, 905, 555, 736.

SOLUTION

368: 300 + 60 + 8 (expanded form); 68 more than 300 (300 + 68 = 368); 32 less than 400 (400 – 32 = 368); 3 hundreds 6 tens 8 ones.
905: 900 + 5 (expanded form); 9 hundreds 0 tens 5 ones; 5 more than 900; 95 less than 1000.
555: 500 + 50 + 5; 5 hundreds 5 tens 5 ones; 55 more than 500; 45 less than 600.
736: 700 + 30 + 6; 7 hundreds 3 tens 6 ones; 36 more than 700; 64 less than 800.
368 = 300+60+8 = 300+68 = 400–32. 905 = 900+5. 555 = 500+50+5. 736 = 700+30+6.

Exercise 9.4 — Skip and Solve — Number Patterns

Q1 Complete the number pattern: __, 720, 730, __, 750, 760 (step +10).

SOLUTION

The pattern adds 10 each time.
710 + 10 = 720 ✓; 720 + 10 = 730 ✓; 730 + 10 = 740; 740 + 10 = 750 ✓; 750 + 10 = 760 ✓.
Missing number before 720 is 710; missing number between 730 and 750 is 740.
710, 720, 730, 740, 750, 760

Q2 Complete the number pattern: 450, __, 650 (step +100).

SOLUTION

The pattern adds 100 each time.
450 + 100 = 550; 550 + 100 = 650.
450, 550, 650

Q3 Complete the number pattern: 880, 905, __ (step +25).

SOLUTION

The pattern adds 25 each time.
880 + 25 = 905 ✓; 905 + 25 = 930.
880, 905, 930

Q4 Complete the number pattern: 800, 830, __, 890 (step +30).

SOLUTION

The pattern adds 30 each time.
800 + 30 = 830 ✓; 830 + 30 = 860; 860 + 30 = 890 ✓.
800, 830, 860, 890

Q5 Complete the number pattern: 845, __, 875 (step +15).

SOLUTION

The pattern adds 15 each time.
845 + 15 = 860; 860 + 15 = 875 ✓.
845, 860, 875

Exercise 9.5 — Number Puzzles — Let us Do

Q1 Write number sentences for the numbers in the centre. (a) Centre = 400. (b) Centre = 775.

SOLUTION

(a) 400: 290 + 110 = 400; 200 + 200 = 400; 300 + 100 = 400; 500 – 100 = 400; 450 – 50 = 400.
(b) 775: 750 + 25 = 775; 800 – 25 = 775; 700 + 75 = 775.
(a) 290+110=400, 200+200=400, 300+100=400 (and others). (b) 750+25=775, 800–25=775 (and others).

Q2 Write numbers in the blank spaces such that they meet the conditions (greater than or less than the centre number 400). Numbers given: 425, 385, 436, 419, 775.

SOLUTION

Centre = 400.
385 < 400 → goes in the 'less than 400' space.
425 > 400 → goes in a 'greater than 400' space.
436 > 400 → goes in a 'greater than 400' space.
419 > 400 → goes in a 'greater than 400' space.
775 > 400 → goes in a 'greater than 400' space.
The diagram shows 400 in the centre with arrows pointing INTO it from the left (numbers less than 400) and arrows pointing AWAY from it to the right (numbers greater than 400). From the given numbers — 419, 385, 425, 436: 385 is less than 400 → goes in a left blank box. 419, 425, 436 are all greater than 400 → go in the right-side boxes (419 and 425 are shown pre-filled on the upper right; 436 is on the lower right). The left blank boxes are filled by the student with numbers of their choice that are less than 400.

Q3 Fill the numbers 384, 23, 176, 905 in the empty circles such that they meet the conditions (ordering conditions shown in the diagram).

SOLUTION

First arrange the numbers in order: 23 < 176 < 384 < 905.
Place them in the circles following the greater-than/less-than arrows in the diagram.
The smallest number (23) goes in the circle that must be less than all others.
The largest number (905) goes in the circle that must be greater than all others.
The diagram shows 3 circles arranged in a triangle with red '>' chevron arrows indicating: top-left circle > top-right circle, top-left circle > bottom circle, top-right circle > bottom circle. This means: top-left is the greatest, top-right is the middle, bottom is the smallest. Arrange the four numbers 23, 176, 384, 905 in ascending order: 23 < 176 < 384 < 905. Place 905 in the top-left circle, 384 in the top-right circle, 176 in the bottom circle. (23 is the extra number — all four numbers satisfy the chain 23 < 176 < 384 < 905, so the three circles show any three consecutive values from this chain that satisfy the given arrow conditions.)

Q4 Match the quantities on the left with the appropriate number ranges on the right: Number of children in your school / Number of books in your classroom / Number of people in a bus / Number of pages in your mathematics book / Number of steps you walk in a day / Number of stars in the sky / Number of flowers in a garland. Ranges: 0–10, 11–50, 51–100, 101–200, 201–500, 501–1000, More than 1000.

SOLUTION

Number of flowers in a garland: typically 11–50.
Number of books in your classroom: typically 51–100.
Number of people in a bus: typically 51–100.
Number of pages in your mathematics book: typically 101–200.
Number of children in your school: typically 201–500.
Number of steps you walk in a day: typically 501–1000 or more than 1000.
Number of stars in the sky: more than 1000.
Note: Answers may vary depending on your school and context; the key is using reasoning to match sensible ranges.
Stars → More than 1000; Steps in a day → 501–1000; Children in school → 201–500; Pages in maths book → 101–200; People in a bus → 51–100; Books in classroom → 11–50 or 51–100; Flowers in a garland → 11–50.

Q5 Match the descriptions with the numbers (150, 425, 367, 400, 100): (a) I have 2 zeroes and am very close to 99. (b) I have 3 hundreds, 6 tens and 7 ones. (c) I have zero tens and zero ones. (d) I am century + half century. (e) I come between 400 and 450, and I have 5 as a digit.

SOLUTION

(a) 'Very close to 99 with 2 zeroes' → 100 (digits 1, 0, 0 — two zeroes; 100 is just 1 more than 99).
(b) '3 hundreds, 6 tens and 7 ones' → 300 + 60 + 7 = 367.
(c) 'Zero tens and zero ones' → 400 (= 4 hundreds, 0 tens, 0 ones).
(d) 'Century + half century' → 100 + 50 = 150.
(e) 'Between 400 and 450 with digit 5' → 425 (contains digit 5; 400 < 425 < 450).
(a) → 100; (b) → 367; (c) → 400; (d) → 150; (e) → 425.

Exercise 9.6 — The Number Detective — Patterns

Q1 Find all the hundreds from 100 to 1000.

SOLUTION

Hundreds are numbers that are exact multiples of 100.
100, 200, 300, 400, 500, 600, 700, 800, 900, 1000.

Q2 Numbers like 123, 345, 789 have consecutive ascending digits, and 876, 321 have consecutive descending digits. Find more such numbers.

SOLUTION

Ascending consecutive digits (each digit is one more than the previous):
123, 234, 345, 456, 567, 678, 789.
Descending consecutive digits (each digit is one less than the previous):
210, 321, 432, 543, 654, 765, 876, 987.
Ascending: 123, 234, 345, 456, 567, 678, 789. Descending: 210, 321, 432, 543, 654, 765, 876, 987.

Q3 Numbers that look the same from left to right and right to left (palindromes): 353, 868. Write other such numbers.

SOLUTION

A number reads the same forwards and backwards.
3-digit palindromes have the form ABA (first digit = last digit).
Examples: 101, 111, 121, 131, 141, 151, 161, 171, 181, 191, 202, 212, 222, 232, 242, 252, 262, 272, 282, 292, 303, 313, 323, 333, 343, 353, 363, 373, 383, 393, ...
Other examples near those given: 343, 363, 373, 383, 393, 858, 878, 888, 898.
Examples: 101, 111, 121, 131, 141, 151, 161, 171, 181, 191, 202, 212, 222 … 343, 353, 363, 373, 383, 393 … 858, 868, 878, 888, 898, 909, 919, 929 …

Q4 Numbers with zeroes like 210, 404, 800. Write more such numbers.

SOLUTION

Write 3-digit numbers that contain at least one zero.
Numbers with zero in tens place: 101, 202, 303, 404, 505, 606, 707, 808, 909, 100, 200, 300, 400, 500, 600, 700, 800, 900.
Numbers with zero in ones place: 110, 120, 130, 210, 220, 230, 310, 320, 410, 420, 510, 520, 610, 620, 710, 720, 810, 820, 910, 920, etc.
Examples: 100, 200, 300, 400, 500, 600, 700, 800, 900, 101, 201, 301, 401, 501, 601, 701, 801, 901, 110, 120, 210, 220, 310, 320, 410, 420, 510, 520, 610, 620, 710, 720.
Some examples: 100, 200, 300, 400, 500, 600, 700, 800, 900 (zero in both tens and ones);

101, 201, 301 … (zero in tens only); 110, 120, 210, 220 … (zero in ones); 404, 505, 606 … (zero in tens); 300, 400, 500 … (zeros in tens and ones).

Exercise 9.7 — Let us Do — Paper Slips

Q1 You have 6 blank paper slips. You can write 100, 10, or 1 on each. (a) What will you write on the 6 slips to make 231? (b) What will you write on the 6 slips to make 123?

SOLUTION

(a) 231 = 200 + 30 + 1 = 2 × 100 + 3 × 10 + 1 × 1.
Write 100 on 2 slips, 10 on 3 slips, 1 on 1 slip. Total slips: 2 + 3 + 1 = 6. ✓
(b) 123 = 100 + 20 + 3 = 1 × 100 + 2 × 10 + 3 × 1.
Write 100 on 1 slip, 10 on 2 slips, 1 on 3 slips. Total slips: 1 + 2 + 3 = 6. ✓
(a) 2 slips of 100, 3 slips of 10, 1 slip of 1. (b) 1 slip of 100, 2 slips of 10, 3 slips of 1.

Q2 Using 6 slips (each showing 100, 10, or 1): (a) What is the largest number that can be made? (b) What is the smallest number that can be made? (c) Are there numbers which cannot be made using these slips?

SOLUTION

(a) Largest: to get the biggest number, use all slips as 100. 6 × 100 = 600.
(b) Smallest: to get the smallest number, use all slips as 1. 6 × 1 = 6.
(c) Numbers that cannot be made: any number that would need the total slip-count to exceed 6. For example, 111 needs 1+1+1 = 3 slips → can be made. 321 needs 3+2+1 = 6 → can be made.
But 312 = 3×100 + 1×10 + 2×1 needs 3+1+2 = 6 → can be made.
Any number where (hundreds digit + tens digit + ones digit) ≤ 6 can be made.
Numbers like 555 need 5+5+5 = 15 slips → cannot be made.
Numbers like 421 need 4+2+1 = 7 slips → cannot be made (one slip too many).
Largest = 600 (all six slips showing 100). Smallest = 6 (all six slips showing 1). Numbers where the digit-sum exceeds 6 cannot be made (e.g., 555 needs 15 slips).

Exercise 9.8 — My Numbers — Digits 3 and 8

Q1 Take the digits 3 and 8. Make as many 2-digit and 3-digit numbers as you can (digits can be repeated). Arrange all numbers from smaller to greater. What is the smallest number? What is the largest?

SOLUTION

2-digit numbers using 3 and 8 (repeats allowed):
33, 38, 83, 88.
3-digit numbers using 3 and 8 (repeats allowed):
333, 338, 383, 388, 833, 838, 883, 888.
All 12 numbers arranged from smallest to largest:
33, 38, 83, 88, 333, 338, 383, 388, 833, 838, 883, 888.
2-digit: 33, 38, 83, 88. 3-digit: 333, 338, 383, 388, 833, 838, 883, 888. Smallest = 33. Largest = 888.

Exercise 9.9 — Let us Think — Bhutasankhya (Word Numerals)

Q1 Teji uses word cards to make numbers. Moon = 1, Char minar (4 towers) = 4. Write the numbers for: (a) North, West, East, South (4 directions) and Sense organs (eyes, ears, nose, tongue, skin = 5). (b) Moon (1) and Palm (5 fingers).

SOLUTION

In Bhutasankhya, each word card gives a digit based on how many of that thing exist in nature or tradition.
The digits are read to form a number (tens digit first, ones digit second).
(a) Directions = 4 (N, S, E, W), Sense organs = 5. Reading as tens then ones: 45. OR ones then tens (right-to-left): 54.
Following the example where Moon(1) + Char minar(4) = 14 (ones=4, tens=1, read right-to-left), here Sense organs(5) as tens and Directions(4) as ones would give 54.
(b) Moon = 1, Palm = 5. Reading as 51 (Moon=tens=5? or ones=1).
Using right-to-left: Palm(5) ones + Moon(1) tens → 15.
The Bhutasankhya system shown in the textbook uses: left card = tens digit, right card = ones digit (as seen from the examples: Sapta svara (7) + Moon (1) = 71; Palm (5) + Tri kala (3) = 53). (a) Card pair: Directions compass (N, S, E, W = 4 directions) and Eyes (2 eyes = 2). Tens = 4, Ones = 2 → the number is 42. (b) Card pair: Sense organs (eyes, ears, nose, tongue, skin = 5 senses) and Hexagon (6 sides = 6). Tens = 5, Ones = 6 → the number is 56.

Q2 Think of other words for digits 0–9. Make new cards for the numbers 15, 27, and 94.

SOLUTION

Some word associations for digits:
0 → Sky (sky is one, but zero stars visible in day? Or: zero = nothing/empty)
1 → Moon, Sun, Earth, God
2 → Eyes, Wings, Hands, Ears
3 → Trikala (Past/Present/Future), Seasons (Summer/Winter/Monsoon)
4 → Directions (N/S/E/W), Char Minar towers, seasons (four)
5 → Fingers on one hand, Senses, Saptapadi (5 vows)
6 → Legs of insects, Seasons in Indian calendar
7 → Days in a week, Notes in music (Sa Re Ga Ma Pa Dha Ni), Rainbow colours
8 → Legs of a spider, Directions (8 cardinal+ordinal)
9 → Planets (traditional count)
For 15: ones=5 (Fingers/Senses), tens=1 (Moon/Sun) → cards showing Moon and Fingers.
For 27: ones=7 (Days of week), tens=2 (Eyes/Hands) → cards showing Eyes and Days.
For 94: ones=4 (Directions), tens=9 (Planets) → cards showing Planets and Directions.
15 = Moon(1) + Fingers(5). 27 = Eyes(2) + Days-of-week(7). 94 = Planets(9) + Directions(4).
Many other valid combinations exist.