Chapter 1: We the Travellers — I

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Exercise 1.1 — Let Us Do — Reading and Writing Large Numbers (p. 5–7)

Q1 Fill in the blanks by continuing the pattern in each of the following sequences.

(a) 456 → 567 → 678 → ___ → ___ → ___ → ___

(b) 1,050 → ___ → 3,150 → 4,200 → ___ → ___ → ___

(c) 5,501 → 6,401 → 7,301 → ___ → ___ → ___ → ___

(d) 10,100 → 10,200 → 10,300 → ___ → ___ → ___ → ___ (snake, ends 10,900)

(e) 10,105 → 10,125 → ___ → ___ → ___ → ___ → ___ → ___ → ___

(f) 10,992 → 10,993 → ___ → ___ → ___ → ___ → ___ → ___ → ___

(g) 10,794 → 10,796 → 10,798 → ___ → ___ → ___ → ___ → ___ → ___

(h) 73,005 → 72,004 → ___ → ___ → ___ → ___ → ___ → ___ → ___

(i) 82,350 → 83,350 → ___ → ___ → ___ → ___ → ___ → ___ → ___

SOLUTION

(a) Pattern: +111 each step.
456, 567, 678, 789, 900, 1,011, 1,122

(b) Pattern: +1,050 each step.
1,050, 2,100, 3,150, 4,200, 5,250, 6,300, 7,350

(c) Pattern: +900 each step.
5,501, 6,401, 7,301, 8,201, 9,101, 10,001, 10,901

(d) Pattern: +100 each step (snake layout).
10,100, 10,200, 10,300, 10,400, 10,500, 10,600, 10,700, 10,800, 10,900

(e) Pattern: +20 each step.
10,105, 10,125, 10,145, 10,165, 10,185, 10,205, 10,225, 10,245, 10,265

(f) Pattern: +1 each step.
10,992, 10,993, 10,994, 10,995, 10,996, 10,997, 10,998, 10,999, 11,000

(g) Pattern: +2 each step.
10,794, 10,796, 10,798, 10,800, 10,802, 10,804, 10,806, 10,808, 10,810

(h) Pattern: −1,001 each step.
73,005, 72,004, 71,003, 70,002, 69,001, 68,000, 66,999, 65,998, 64,997

(i) Pattern: +1,000 each step.
82,350, 83,350, 84,350, 85,350, 86,350, 87,350, 88,350, 89,350, 90,350

Answer: (a) 789, 900, 1,011, 1,122 (b) 2,100; 5,250, 6,300, 7,350 (c) 8,201, 9,101, 10,001, 10,901 (d) 10,400–10,900 in steps of 100 (e) +20: 10,145, 10,165, 10,185, 10,205, 10,225, 10,245, 10,265 (f) +1: 10,994–11,000 (g) +2: 10,800–10,810 (h) −1,001: 71,003–64,997 (i) +1,000: 84,350–90,350

Q2 Fill in the blanks appropriately. Use commas as required.

Number | Number Name
8,045 | Eight thousand forty-five
7,209 | ___
10,599 | ___
___ | Ten thousand seven hundred forty-three
20,869 | Twenty thousand eight hundred sixty-nine
13,579 | ___
___ | Ten thousand ten
___ | Fifty-six thousand four hundred ninety-one
45,045 | ___
39,593 | ___
50,005 | ___
26,050 | ___
81,200 | ___
___ | Ninety thousand nine
___ | Twenty-three thousand two hundred thirty
___ | Thirty-six thousand one

SOLUTION

7,209 → Seven thousand two hundred nine
10,599 → Ten thousand five hundred ninety-nine
Ten thousand seven hundred forty-three → 10,743
13,579 → Thirteen thousand five hundred seventy-nine
Ten thousand ten → 10,010
Fifty-six thousand four hundred ninety-one → 56,491
45,045 → Forty-five thousand forty-five
39,593 → Thirty-nine thousand five hundred ninety-three
50,005 → Fifty thousand five

26,050 → Twenty-six thousand fifty
81,200 → Eighty-one thousand two hundred
Ninety thousand nine → 90,009
Twenty-three thousand two hundred thirty → 23,230
Thirty-six thousand one → 36,001

Answer: Missing numbers: 10,743 | 10,010 | 56,491 | 90,009 | 23,230 | 36,001. Missing names: Seven thousand two hundred nine | Ten thousand five hundred ninety-nine | Thirteen thousand five hundred seventy-nine | Forty-five thousand forty-five | Thirty-nine thousand five hundred ninety-three | Fifty thousand five | Twenty-six thousand fifty | Eighty-one thousand two hundred

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Q3 Arrange the numbers below in increasing order. You can use the number line (0 to 80,000) if required.
40,347 34,407 40,473 34,740 73,404 74,430 47,340 18,926

SOLUTION

Compare by number of digits, then leading digit, then next digit, and so on.
All are 5-digit numbers. Sort by ten-thousands digit first:
18,926 ($1_)$, 34,407 ($3_)$, 34,740 ($3_)$, 40,347 ($4_)$, 40,473 ($4_)$, 47,340 ($4_)$, 73,404 ($7_)$, 74,430 ($7_)$

34,407 vs 34,740: both 34,___; 4 < 7 in hundreds → 34,407 < 34,740
40,347 vs 40,473: both 40,___; 3 < 4 in hundreds → 40,347 < 40,473
40,473 vs 47,340: 40,___ < 47,___ ✓
73,404 vs 74,430: 73,___ < 74,___ ✓

Answer: 18,926 < 34,407 < 34,740 < 40,347 < 40,473 < 47,340 < 73,404 < 74,430

Q4 A student said 9,990 is greater than 49,014 because 9 is greater than 4. Is the student correct? Why or why not?
Also fill in the blanks on the number line (5,000 to 50,000) to show the positions of 9,990 and 49,014.

SOLUTION

The student is WRONG.
9,990 has 4 digits; 49,014 has 5 digits.
A 5-digit number is always greater than any 4-digit number.
So 49,014 > 9,990.

The number line runs: 5,000 | 10,000 | 15,000 | 20,000 | 25,000 | 30,000 | 35,000 | 40,000 | 45,000 | 50,000
9,990 falls just before 10,000 (between 5,000 and 10,000).
49,014 falls just after 45,000 (between 45,000 and 50,000).

Place-value comparison using the chart:
9,990: TTh=0, Th=9, H=9, T=9, O=0

49,014: TTh=4, Th=9, H=0, T=1, O=4
Since 49,014 has a non-zero TTh digit and 9,990 does not, 49,014 is larger.

Answer: No. 9,990 has 4 digits; 49,014 has 5 digits, so 49,014 > 9,990. Comparing number of digits comes before comparing individual digits.

Q5 Digit swap
(a) In the number 1,478, interchanging the digits 7 and 4 gives 1,748. Now, interchange any two digits in 1,478 to make a number larger than 5,500.
(b) Interchange two digits of 10,593 to make a number:
i) Between 11,000 and 15,000
ii) More than 35,000
(c) Interchange two digits of 48,247 to make a number:
i) As small as possible
ii) As big as possible

SOLUTION

(a) Digits of 1,478 are: 1, 4, 7, 8.
Swap 1 and 7 → 7,418 (7,418 > 5,500 ✓)
Swap 1 and 8 → 8,471 (8,471 > 5,500 ✓)
Either 7,418 or 8,471 works.

(b) Digits of 10,593 are: 1, 0, 5, 9, 3.
i) Between 11,000 and 15,000:
Swap 0 and 3 → 13,590 (13,590 is between 11,000 and 15,000 ✓)
ii) More than 35,000:
Swap 1 and 5 → 50,193 (50,193 > 35,000 ✓) OR
Swap 0 and 3 gives 13,590 (too small); swap 1 and 9 → 90,513 > 35,000 ✓
Also swap 0 and 5 → 15,093 (no); swap 0 and 9 → 19,503 (no).
Valid answers: 50,193 or 90,513.

(c) Digits of 48,247 are: 4, 8, 2, 4, 7.
i) As small as possible: swap 4 (ten-thousands) and 2 (hundreds) → 28,447 (smallest swap)
ii) As big as possible: swap 4 (ten-thousands) and 8 (thousands) → 84,247 (largest swap)

Answer: (a) 7,418 or 8,471 (b-i) 13,590 (b-ii) 50,193 or 90,513 (c-i) 28,447 (c-ii) 84,247

Exercise 1.2 — Nearest Tens, Hundreds, and Thousands — Rabbit Fill-ins (p. 7–8)

Q1 The rabbit is at 2,346. Its food is at the neighbouring hundreds (2,300 and 2,400). Which is the nearest hundred of 2,346? How many jumps does it need?

SOLUTION

2,346 lies between 2,300 and 2,400.
Distance to 2,300: 2,346 − 2,300 = 46 jumps.
Distance to 2,400: 2,400 − 2,346 = 54 jumps.
Since 46 < 54, the nearest hundred is 2,300.

Answer: 2,300 is the nearest hundred of 2,346. It will need 46 jumps to reach 2,300.

Q2 The rabbit is at 2,346. Its food is at the neighbouring thousands (2,000 and 3,000). Which is the nearest thousand of 2,346? How many jumps does it need?

SOLUTION

Distance to 2,000: 2,346 − 2,000 = 346 jumps.
Distance to 3,000: 3,000 − 2,346 = 654 jumps.
Since 346 < 654, the nearest thousand is 2,000.

Answer: 2,000 is the nearest thousand of 2,346. It will need 346 jumps to reach 2,000.

Q3 Fill in the boxes: find the nearest tens, nearest hundreds, and nearest thousands for each number.

Number	Nearest Tens	Nearest Hundreds	Nearest Thousands
3,176			
4,017			
5,789			
8,203			

SOLUTION

Rule: look at the digit in the place below.
Nearest ten → look at ones digit: <5 round down, ≥5 round up.
Nearest hundred → look at tens digit: <5 round down, ≥5 round up.
Nearest thousand → look at hundreds digit: <5 round down, ≥5 round up.

3,176: ones=6 ≥5 → tens=3,180; tens=7 ≥5 → hundreds=3,200; hundreds=1 <5 → thousands=3,000
4,017: ones=7 ≥5 → tens=4,020; tens=1 <5 → hundreds=4,000; hundreds=0 <5 → thousands=4,000
5,789: ones=9 ≥5 → tens=5,790; tens=8 ≥5 → hundreds=5,800; hundreds=7 ≥5 → thousands=6,000
8,203: ones=3 <5 → tens=8,200; tens=0 <5 → hundreds=8,200; hundreds=2 <5 → thousands=8,000

Answer: 3,176: 3,180 | 3,200 | 3,000. 4,017: 4,020 | 4,000 | 4,000. 5,789: 5,790 | 5,800 | 6,000. 8,203: 8,200 | 8,200 | 8,000.

Exercise 1.3 — Let Us Think — Rounding Numbers (p. 8–9)

Q1 Vijay rounded off a number to the nearest hundred. Suma rounded off the same number to the nearest thousand. Both got the same result. Circle the numbers they might have used:
7,126 7,835 7,030 6,999

SOLUTION

We need: nearest_hundred(n) = nearest_thousand(n).

7,126: nearest hundred = 7,100; nearest thousand = 7,000. Different.
7,835: nearest hundred = 7,800; nearest thousand = 8,000. Different.
7,030: nearest hundred = 7,000; nearest thousand = 7,000. SAME ✓
6,999: nearest hundred = 7,000; nearest thousand = 7,000. SAME ✓

Answer: 7,030 and 6,999 — both round to 7,000 for both nearest hundred and nearest thousand.

Q2 Think and write two numbers that have the same —
(a) Nearest ten
(b) Nearest hundred
(c) Nearest thousand

SOLUTION

(a) Example: 21 and 24.
Both have nearest ten = 20. (21−20=1, 24−20=4; both <5 from 20.)

(b) Example: 120 and 140.
Both have nearest hundred = 100. (120−100=20, 140−100=40; both <50.)

(c) Example: 2,100 and 2,400.
Both have nearest thousand = 2,000. (2,100−2,000=100, 2,400−2,000=400; both <500.)

Answer: (a) e.g. 21 and 24 (nearest ten = 20) (b) e.g. 120 and 140 (nearest hundred = 100) (c) e.g. 2,100 and 2,400 (nearest thousand = 2,000)

Q3 Think and write numbers that have the same —
(a) Nearest ten and nearest hundred
(b) Nearest hundred and nearest thousand
(c) Nearest ten, hundred and thousand

SOLUTION

(a) Nearest ten = nearest hundred means both round to a multiple of 100.
Example: 1,001 and 1,003.
1,001: nearest ten=1,000; nearest hundred=1,000. Same ✓
1,003: nearest ten=1,000; nearest hundred=1,000. Same ✓

(b) Nearest hundred = nearest thousand means both round to a multiple of 1,000.
Example: 2,001 and 2,049.

2,001: nearest hundred=2,000; nearest thousand=2,000. Same ✓
2,049: nearest hundred=2,000; nearest thousand=2,000. Same ✓

(c) All three must be equal, meaning n is very close to a multiple of 1,000.
Example: 3,001 and 3,004.
3,001: nearest ten=3,000; nearest hundred=3,000; nearest thousand=3,000. Same ✓
3,004: nearest ten=3,000; nearest hundred=3,000; nearest thousand=3,000. Same ✓

Answer: (a) e.g. 1,001 and 1,003 (all round to 1,000 for both ten and hundred) (b) e.g. 2,001 and 2,049 (both round to 2,000 for hundred and thousand) (c) e.g. 3,001 and 3,004 (both round to 3,000 for all three)

Exercise 1.4 — Let Us Do — Travel Distances and Vehicles (p. 10)

Q1 A cyclist can cover 15 km in one hour. How much distance will she cover in 4 hours, if she maintains the same speed?

SOLUTION

Distance in 4 hours = 15 × 4 = 60 km.

Answer: 60 km

Q2 A school has 461 girls and 439 boys. How many vehicles are needed for all of them to travel using each of the following?
(a) Bicycle (2) (b) Autorickshaw (3) (c) Car (4) (d) Big car (6)
(e) Tempo traveller (10) (f) Boat (20) (g) Minibus (25) (h) Aeroplane (180)

SOLUTION

Total students = 461 + 439 = 900.
Number of vehicles needed = total ÷ capacity, rounded UP (since partial vehicles must still run).

(a) Bicycle (2): 900 ÷ 2 = 450 bicycles
(b) Autorickshaw (3): 900 ÷ 3 = 300 autorickshaws
(c) Car (4): 900 ÷ 4 = 225 cars
(d) Big car (6): 900 ÷ 6 = 150 big cars
(e) Tempo traveller (10): 900 ÷ 10 = 90 tempo travellers
(f) Boat (20): 900 ÷ 20 = 45 boats
(g) Minibus (25): 900 ÷ 25 = 36 minibuses
(h) Aeroplane (180): 900 ÷ 180 = 5 aeroplanes

Answer: Total students = 900. (a) 450 bicycles (b) 300 autorickshaws (c) 225 cars (d) 150 big cars (e) 90 tempo travellers (f) 45 boats (g) 36 minibuses (h) 5 aeroplanes

Exercise 1.5 — Pastime Mathematics — Logic Puzzles (p. 11–13)

Q1 River crossing puzzle: A boatman must take a lion, a sheep, and a bundle of grass across a river. He can carry one at a time. If left alone, the sheep eats the grass, and the lion eats the sheep. How does he cross everything safely in the minimum number of trips?

SOLUTION

Key insight: the sheep cannot be left alone with the lion or the grass.
So take the sheep first, and when returning, bring the sheep back if needed.

Trip 1 (→): Take sheep across.	Left shore: Lion, Grass	Right shore: Sheep
Trip 2 (←): Return alone.	Left shore: Lion, Grass	Right shore: Sheep
Trip 3 (→): Take lion across.	Left shore: Grass	Right shore: Sheep, Lion
Trip 4 (←): Bring sheep back.	Left shore: Grass, Sheep	Right shore: Lion
Trip 5 (→): Take grass across.	Left shore: Sheep	Right shore: Lion, Grass
Trip 6 (←): Return alone.	Left shore: Sheep	Right shore: Lion, Grass
Trip 7 (→): Take sheep across.	Left shore: (empty)	Right shore: Lion, Grass, Sheep

All three are across safely. Total: 7 trips (minimum).

Answer: 7 trips: (1) Take sheep →, (2) Return alone ←, (3) Take lion →, (4) Bring sheep back ←, (5) Take grass →, (6) Return alone ←, (7) Take sheep →.

Q2 Pile of pebbles (Nim): Two piles, each with 7 pebbles. Players take any number from one pile per turn. The player who picks the last pebble wins. How do you play to win?

SOLUTION

Try with small cases first:
(1,1): whoever moves faces the other pile alone, loses if opponent mirrors. Second player wins.
(2,2), (3,3), ..., (7,7): same pattern — equal piles.

Winning strategy: the SECOND player wins from equal piles by mirroring.
If your opponent takes k pebbles from one pile, you take k pebbles from the other pile.
This always leaves equal piles for your opponent.
Eventually your opponent faces (1,1): they take 1, you take the last pebble and win.

If you go first from (7,7): any move creates unequal piles, and your opponent mirrors you.
→ You cannot win as the first player from equal piles (with perfect play by the opponent).

To win: go second. Match every move your opponent makes on the other pile.

Answer: Go second and mirror: whatever your opponent takes from one pile, take the same number from the other pile. This always leaves equal piles until you pick the last pebble and win.

Q3 Mira's digit puzzle: Take any two different digits, form two 2-digit numbers, subtract smaller from larger, then use the two digits of the result and repeat. You always get 9 in the end.
(1) What do all the differences in the example (36, 27, 45, 9) have in common?
(2) Try with another pair of digits. What is always common?
(3) What digits give a 1-digit number in the first step?
(4) Find different digits whose numbers differ by 27.
(5) In Mira's table (3,7 → 36; 1,9 → 72; 2,8 → 54; 4,5 → 9), extend for differences 2, 3, 5, 7 (in digit differences).

SOLUTION

(1) All differences (36, 27, 45, 9) are multiples of 9.
36 = 4×9, 27 = 3×9, 45 = 5×9, 9 = 1×9.

(2) Using any other pair, the first difference is always a multiple of 9.
Reason: if digits are a and b (b > a), the two numbers are 10b+a and 10a+b.
Difference = (10b+a) − (10a+b) = 9(b−a), which is always a multiple of 9.
The chain always ends at 9 (the smallest positive multiple of 9).

(3) The difference is 1-digit (= 9) in the first step when 9(b−a) = 9, i.e. b−a = 1.
Pairs with consecutive digits: (0,1), (1,2), (2,3), (3,4), (4,5), (5,6), (6,7), (7,8), (8,9).
Example: digits 4,5 → 54−45 = 9 ✓

(4) Difference = 27 means 9(b−a) = 27, so b−a = 3.
Valid pairs: (0,3), (1,4), (2,5), (3,6), (4,7), (5,8), (6,9).
Example: digits 2,5 → 52−25 = 27 ✓

(5) Mira's table extended for digit differences 2, 3, 5, 7:

Digit diff 2 → e.g. digits 0,2: 20−02=18	number difference = 18
Digit diff 3 → e.g. digits 0,3: 30−03=27	number difference = 27
Digit diff 5 → e.g. digits 0,5: 50−05=45	number difference = 45
Digit diff 7 → e.g. digits 0,7: 70−07=63	number difference = 63

Pattern: number difference = 9 × (digit difference).

Answer: (1) All multiples of 9. (2) Always a multiple of 9; always ends at 9. (3) Consecutive digits (differ by 1): e.g. (4,5), (7,8). (4) b−a = 3: e.g. digits 2,5 (52−25=27). (5) Diff 2→18, diff 3→27, diff 5→45, diff 7→63. Rule: number difference = 9 × digit difference.

Exercise 1.6 — Let Us Do — Comparing and Ordering Large Numbers, Expanded Form, Note Counts (

Q1 Write 5 numbers between 23,568 and 24,234.

SOLUTION

Any 5 numbers strictly between 23,568 and 24,234 are correct.
Example: 23,600 | 23,700 | 23,800 | 24,000 | 24,100
Verify: 23,568 < 23,600 < 23,700 < 23,800 < 24,000 < 24,100 < 24,234 ✓

Answer: Example: 23,600 | 23,700 | 23,800 | 24,000 | 24,100 (any five valid numbers between 23,568 and 24,234)

Q2 Write 5 numbers that are more than 38,125 but less than 38,600.

SOLUTION

Example: 38,200 | 38,300 | 38,350 | 38,400 | 38,500
Verify: 38,125 < 38,200 < 38,300 < 38,350 < 38,400 < 38,500 < 38,600 ✓

Answer: Example: 38,200 | 38,300 | 38,350 | 38,400 | 38,500

Q3 Ravi's car has been driven for 56,987 km. Sheetal's car has been driven 67,543 km. Whose car has been driven more?

SOLUTION

Compare: 56,987 vs 67,543.
67,543 has a larger ten-thousands digit (6 > 5), so 67,543 > 56,987.
Sheetal's car has been driven more.

Answer: Sheetal's car (67,543 km > 56,987 km)

Q4 Arrange the prices of electric bikes in ascending (increasing) order:
Rs 90,000 | Rs 89,999 | Rs 94,983 | Rs 49,900 | Rs 93,743 | Rs 39,999

SOLUTION

Sort: compare leading digits.
Rs 39,999 < Rs 49,900 < Rs 89,999 < Rs 90,000 < Rs 93,743 < Rs 94,983

Quick check: 89,999 vs 90,000 → 89,999 < 90,000 ✓
93,743 vs 94,983 → 93,___ < 94,___ ✓

Answer: Rs 39,999 < Rs 49,900 < Rs 89,999 < Rs 90,000 < Rs 93,743 < Rs 94,983

Q5 Arrange the town populations in descending (decreasing) order:
Town 1: 65,232 | Town 2: 53,231 | Town 3: 56,380 | Town 4: 51,336 | Town 5: 45,858 | Town 6: 66,540

SOLUTION

Sort in decreasing order:
66,540 > 65,232 > 56,380 > 53,231 > 51,336 > 45,858

That is: Town 6, Town 1, Town 3, Town 2, Town 4, Town 5.

Answer: Town 6 (66,540) > Town 1 (65,232) > Town 3 (56,380) > Town 2 (53,231) > Town 4 (51,336) > Town 5 (45,858)

Q6 Find numbers between 42,750 and 53,500 such that the ones, tens, and hundreds digits are all 0.

SOLUTION

Ones=0, tens=0, hundreds=0 means the number is a multiple of 1,000.
Multiples of 1,000 between 42,750 and 53,500:
43,000 | 44,000 | 45,000 | 46,000 | 47,000 | 48,000 | 49,000 | 50,000 | 51,000 | 52,000 | 53,000
Verify bounds: 42,750 < 43,000 and 53,000 < 53,500 ✓

Answer: 43,000; 44,000; 45,000; 46,000; 47,000; 48,000; 49,000; 50,000; 51,000; 52,000; 53,000 (all multiples of 1,000 in the range)

Q7 Write the following numbers in expanded form.
(a) 783 = 700 + 80 + 3 [done]
(b) 8,062
(c) 9,980
(d) 10,304
(e) 23,004
(f) 70,405

SOLUTION

(b) 8,062 = 8,000 + 60 + 2
(c) 9,980 = 9,000 + 900 + 80
(d) 10,304 = 10,000 + 300 + 4
(e) 23,004 = 20,000 + 3,000 + 4
(f) 70,405 = 70,000 + 400 + 5

Answer: (b) 8,000 + 60 + 2 (c) 9,000 + 900 + 80 (d) 10,000 + 300 + 4 (e) 20,000 + 3,000 + 4 (f) 70,000 + 400 + 5

Q8 Fill in the blanks with the correct answer.
(a) 983 = 90 Tens + 83 Ones [done]
(b) 68 = ___ Tens + 18 Ones
(c) 607 = 4 Hundreds + ___ Ones
(d) 5,621 = 4 Thousands + ___ Hundreds + 2 Tens + ___ Ones
(e) 7,069 = ___ Thousands + 20 Hundreds + ___ Ones
(f) 37,608 = ___ Ten Thousands + 17 Thousands + ___ Hundreds + 8 Ones
(g) 43,001 = 3 Ten Thousands + ___ Thousands + ___ Hundreds + 1 Ones

SOLUTION

(b) 68 = _×10 + 18 → _×10 = 68−18 = 50 → 5 Tens
Check: 5×10 + 18 = 50+18 = 68 ✓

(c) 607 = 4×100 + ___ → ___ = 607−400 = 207 Ones
Check: 400+207 = 607 ✓

(d) 5,621 = 4,000 + ___×100 + 20 + ___ → 5,621−4,000−20 = 1,601
1,601 = 16 Hundreds + 1 One
Check: 4,000+1,600+20+1 = 5,621 ✓

(e) 7,069 = _×1,000 + 20×100 + ___ → 20 Hundreds = 2,000
7,069−2,000 = 5,069 = 5,000 + 69 → 5 Thousands + 69 Ones
Check: 5,000+2,000+69 = 7,069 ✓

(f) 37,608 = _×10,000 + 17×1,000 + _×100 + 8
17×1,000 = 17,000; 37,608−17,000−8 = 20,600
20,600 = 2×10,000 + 6×100 → 2 Ten Thousands + 6 Hundreds
Check: 20,000+17,000+600+8 = 37,608 ✓

(g) 43,001 = 3×10,000 + _×1,000 + _×100 + 1
3×10,000 = 30,000; 43,001−30,000−1 = 13,000 = 13×1,000 + 0×100
→ 13 Thousands + 0 Hundreds
Check: 30,000+13,000+0+1 = 43,001 ✓

Answer: (b) 5 Tens (c) 207 Ones (d) 16 Hundreds, 1 One (e) 5 Thousands, 69 Ones (f) 2 Ten Thousands, 6 Hundreds (g) 13 Thousands, 0 Hundreds

Q9 Fill in the blanks.
(a) How many notes of Rs 10 are there in Rs 7,934?
(b) How many notes of Rs 100 are there in Rs 7,934?
(c) How many thousands are there in 7,934?
(d) How many Rs 500 notes are there in Rs 7,934? (Hint: observe answer of (c))
(e) How many notes of Rs 10 are there in Rs 65,342?
(f) How many notes of Rs 100 are there in Rs 65,342?
(g) How many thousands are there in 65,342?
(h) How many Rs 500 notes are there in Rs 65,342?

SOLUTION

(a) Rs 7,934 ÷ Rs 10 = 793 notes (remainder Rs 4, which cannot make another Rs 10 note)

(b) Rs 7,934 ÷ Rs 100 = 79 notes (remainder Rs 34)

(c) 7,934 ÷ 1,000 = 7 thousands (remainder 934)

(d) Hint: there are 7 thousands in 7,934, i.e. 7,000.

Rs 7,934 ÷ Rs 500 = 15 notes (remainder Rs 434). Check: 15×500=7,500; 7,934−7,500=434.

(e) Rs 65,342 ÷ Rs 10 = 6,534 notes (remainder Rs 2)

(f) Rs 65,342 ÷ Rs 100 = 653 notes (remainder Rs 42)

(g) 65,342 ÷ 1,000 = 65 thousands (remainder 342)

(h) Rs 65,342 ÷ Rs 500 = 130 notes (remainder Rs 342). Check: 130×500=65,000; 65,342−65,000=342.

Answer: (a) 793 (b) 79 (c) 7 (d) 15 (e) 6,534 (f) 653 (g) 65 (h) 130

Exercise 1.7 — King's Horses — Counting Puzzle (p. 15–16)

Q1 The caretaker arranged 19 horses (after 1 was stolen from 20) in the square stable so that the king counted 5 along each side and believed all 20 were present. Count the horses in the figure one by one. Were there really 20? What was the caretaker's trick?

SOLUTION

Count the dots in the figure one by one. The stable is a square ring of cells (the middle is empty).
Top row: 1 + 2 + 2 + 0 = 5 horses.
Left column: 1 + 1 + 3 + 0 = 5 horses.
Right column: 0 + 2 + 3 + 0 = 5 horses.
Bottom row: 0 + 2 + 3 + 0 = 5 horses.

Counting every dot exactly once gives: 1+2+2 + 1 + 2 + 3 + 3 + 2+3 = 19 horses.
(This matches the story — one horse was stolen from 20, so 19 remain.)

Why the king's count of 20 is wrong: a horse in a CORNER cell belongs to two sides, so it is counted once for each side.
Here only the top-left corner is occupied (1 horse), so the king's 5 × 4 = 20 counts that one corner horse twice.
Sum of the four sides = actual total + horses sitting in corners → 20 = 19 + 1. So the real total is 19.

Answer: No — there were only 19 horses, not 20. Counting the dots one by one gives 19. The king's 5 × 4 = 20 counts the single occupied (top-left) corner horse twice; 20 − 1 = 19.

Q2 Another horse is stolen (18 remain). The caretaker again arranges 18 horses so that there are 5 on each side. How is this possible? Arrange the 18 horses in the stable with 5 on each side.

SOLUTION

Key idea: sum of the four sides = actual total + (horses sitting in corners), because each corner horse is counted on two sides.
We need each side = 5, so the four sides add up to 5 × 4 = 20.
For 18 horses: corner horses = 20 − 18 = 2.
So put just 2 horses in the corners altogether, and fill the middle cells of each side to make every side total 5.

One valid arrangement (using the same square ring as the figure):
Top side: corner 2, middles 2 and 1, corner 0 → 2 + 2 + 1 + 0 = 5 ✓
Left side: corner 2, middles 1 and 2, corner 0 → 2 + 1 + 2 + 0 = 5 ✓
Right side: corner 0, middles 2 and 3, corner 0 → 0 + 2 + 3 + 0 = 5 ✓
Bottom side: corner 0, middles 2 and 3, corner 0 → 0 + 2 + 3 + 0 = 5 ✓
Total = 2 (corners) + (2+1) + (1+2) + (2+3) + (2+3) = 18 ✓

Answer: Yes. Since side-sum 20 = total + corner horses, 18 horses need only 2 horses in the corners. Keep each side at 5 by adding horses to the middle cells. Example: one corner has 2 horses, the rest sit along the sides so every side totals 5; total = 18.

Q3 How many more horses can the thief steal before the king notices something is wrong?

SOLUTION

We need the SMALLEST total of horses for which '5 on each side' is still possible.

Total horses = 20 − (horses sitting in corners), because the four sides add to 20 and each corner horse is counted twice.
So to make the total as small as possible, put as MANY horses in the corners as allowed.
Each side holds 5, and a side's two end (corner) cells can hold at most 5 between them.
Greatest possible corner total: put 5 in two opposite corners and 0 in the other two → corner total = 10.
(Check: each side then has one corner with 5 and one with 0, and the middle cells are 0, giving 5 per side.)

Minimum total = 20 − 10 = 10 horses.
From 18 horses, the thief can steal 18 − 10 = 8 more (down to 10 horses).
Below 10, no arrangement gives 5 on every side, so the king would notice.

Answer: The thief can steal 8 more horses (from 18 down to 10). At 10 horses, 5-per-side is still possible. At 9 horses, it is impossible and the king notices.