Unit 3 · Number Sense

HARDER PRACTICE QUESTIONS · ANSWER KEY

Full marks 33

Give the marks for the points in the marking scheme; an answer in other words that says the same is right.

1 Find the number from the clues

ANSWER A · 4

Ten crore 7, crore 2, ten lakh 0, lakh 8, ten thousand 1, thousand 5, hundred 4, ten 1, one 9.

i. **72,08,15,419**
ii. **seventy-two crore eight lakh fifteen thousand four hundred nineteen**
iii. **720,815,419**: **seven hundred twenty million eight hundred fifteen thousand four hundred nineteen**

MARKING SCHEME

- ✓ The digits 7, 2, 0 and 8 found.
- ✓ 72,08,15,419.
- ✓ The national words.
- ✓ The international commas and words.

2 How many in all?

ANSWER U · 3

i. Read every digit up to the lakh place: **4,567 lakhs**.
ii. **456,789,123**. Read up to the million place: **456 millions**.
iii. 1 million = 10 lakh. So every 10 lakhs make 1 million: 4,567 lakhs is 456 groups of 10 lakhs, with 7 lakhs left over.

MARKING SCHEME

- ✓ 4,567 lakhs.
- ✓ 456,789,123 and 456 millions.
- ✓ 1 million = 10 lakh, so 10 lakhs make each million.

3 Spot the error

ANSWER U · 3

i. After the first comma, every group must have **two** digits. “Four lakh” fills two places: 0 in the ten lakh place and 4 in the lakh place. She wrote only the 4, so she lost a place.
ii. **60,04,00,009**
iii. **600,400,009**

MARKING SCHEME

- ✓ The lakh group needs two digits, 04.
- ✓ 60,04,00,009.
- ✓ 600,400,009.

4 Three 7s, very different

ANSWER A · 3

i. Ten lakh place: **70,00,000**. Thousand place: **7,000**. Tens place: **70**.
ii. 70,00,000 − 7,000 = **69,93,000**.
iii. **None.** The face value of each is 7, but none of them is in the ones place, so each place value is more than 7.

MARKING SCHEME

- ✓ 70,00,000, 7,000 and 70.
- ✓ 69,93,000.
- ✓ None, since no 7 is in the ones place.

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5 Rounding backwards

ANSWER HA · 4

i. Numbers from halfway below, 4,650, round up to 4,700. 4,750 would round up to 4,800. So the smallest is **4,650** and the biggest is **4,749**.

ii. To the nearest ten it is 350: so it is from 345 to 354. To the nearest hundred it is 300: so its tens digit is less than 5, which means it is less than 350. Both together: **345, 346, 347, 348 or 349**.

MARKING SCHEME

- ✓ Smallest 4,650.
- ✓ Biggest 4,749.
- ✓ From 345 to 354 for the nearest ten.
- ✓ Only 345 to 349, since it must be under 350.

6 Cards with digits

ANSWER A · 3

i. Biggest digit in the highest place, and so on: **87,65,43,210**.

ii. 0 can't go first, so 1 goes first, then 0, then the rest in order: **10,23,45,678**.

iii. 10,23,45,678 ends in 8, which is even. Keep the start as small as possible and put an odd digit last: swap the 7 and the 8. **10,23,45,687**.

MARKING SCHEME

- ✓ 87,65,43,210.
- ✓ 10,23,45,678.
- ✓ 10,23,45,687.

7 Census numbers

ANSWER A · 3

i. The hundreds digit is 5, so the thousands go up by 1: **2,91,65,000**.

ii. In the international system the number is 29,164,578. Read up to the million place: **29 millions** in all, and a bit more.

iii. **Nearer to 3 crore.** It is more than 91 lakh above 2 crore, but less than 9 lakh below 3 crore: $3,00,00,000 - 2,91,64,578 = 8,35,422$.

MARKING SCHEME

- ✓ 2,91,65,000.
- ✓ 29,164,578 has 29 millions.
- ✓ Nearer to 3 crore, with a reason.

8 Sums of primes

ANSWER HA · 4

i. **3 + 37**, **11 + 29** and **17 + 23**: three ways. (5 + 35, 7 + 33, 13 + 27 and 19 + 21 don't work: 35, 33, 27 and 21 are composite.)

ii. **No.** Two odd numbers add up to an even number, so one of the two primes must be even. The only even prime is 2, and $27 - 2 = 25 = 5 \times 5$ is composite. So there is no way.

MARKING SCHEME

- ✓ Two of the three ways.
- ✓ All three ways, and no others.
- ✓ One prime must be 2, since the sum is odd.
- ✓ 25 is composite, so no.

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9 True or not?

ANSWER U · 3

Not always. For a digit in the **ones place**, the place value is the same as the face value: in 245, the 5 is worth 5. And a **0** has place value 0 in any place: in 3,05,000, the 0 in the ten thousand place is worth 0 × 10,000 = 0. In other places, the place value of a digit from 1 to 9 is bigger than its face value.

MARKING SCHEME

- ✓ Not always.
- ✓ Example: a digit in the ones place.
- ✓ Example: the digit 0.

10 Think

ANSWER HA · 3

For example, **4,59,99,600**. The hundreds digit is 6, so the thousand digit goes up by 1. But it is 9, and 9 + 1 makes 10: the thousand digit becomes 0 and 1 is carried to the ten thousand place, which is 9 too, so it carries again to the lakh place. 4,59,99,600 becomes **4,60,00,000**: the lakh digit changes from 9 to 0, and the ten lakh digit from 5 to 6.

It happens when the digits in the thousand and ten thousand places are both 9, and the hundreds digit is 5 or more.

MARKING SCHEME

- ✓ A nine-digit number that works.
- ✓ Its correct rounding.
- ✓ The reason: 9s in the thousand and ten thousand places carry the 1 into the lakh place.

See it at Science Playground

Exhibits and plants at the center, Bhaktapur, that go with this unit. Book a class visit at science-playground.com/booking.

- **Classic Bead Abacus** (exhibit): Let each rod be a place, ones to ten crore, and show a nine-digit number with beads. Ten on one rod make one on the next.
- **Soroban Abacus** (exhibit): Find the small dots on the middle bar, one on every third rod. They split the rods into threes, like the periods of the international system.

Marks by level	Knowledge	Understanding	Application	Higher ability	Total
Marks	0	9	13	11	**33**

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