Grade 4 Unit 1 quiz 1: Numbers to one million, Rounding to any place, including decimals, Tally marks and Roman numerals (answer key)

8 questions, 19 points

ANSWERS AT A GLANCE

1. (a) 10 (b) 40 (c) 70,000 (d) 100
2. (a) 9,000 (b) 10,000 (c) 99,000 (d) 100,000 (e) 10,000. One more digit: (b), (d) and (e).
3. (a) X (b) C (c) C
4. (a) five hundred eight thousand, sixty (b) 90,402
5. (a) Henry 8, Louis 14 (b) XIV uses the pair IV.
6. (a) 371,517 visitors (b) The ten thousands digit changed, from 4 to 7.
7. No. 246,507 ≈ 250,000 to the nearest ten thousand. The thousands digit is 6, which is 5 or more, so the number rounds up; Omar only changed the digits after the ten thousands place to zeros.
8. Hundred thousands digit 4, ten thousands digit 2. The thousands digit 7 means the number rounded up, so it sits between 420,000 and 430,000.

WORKED SOLUTIONS

1. Fill in each blank. (2 points)

(a) 1 hundred thousand = _____ ten thousands

(b) 400,000 = _____ ten thousands

(c) 70 thousands = _____

(d) 1,000,000 = _____ ten thousands

ANSWER

(a) 10 (b) 40 (c) 70,000 (d) 100

SOLUTION

(a) Ten ten thousands make one hundred thousand, so 1 hundred thousand is 10 ten thousands.

(b) Each hundred thousand is 10 ten thousands, so 4 hundred thousands is 40 ten thousands.

(c) 70 thousands is 7 ten thousands, which is 70,000.

(d) One million is 10 hundred thousands, and each of those is 10 ten thousands: 10 × 10 = 100 ten thousands.

SCORING

2 points: all four blanks right. 1 point: two or three right.

2. Round each number to the nearest thousand. Then say which rounded numbers have one more digit than the number you started with. (3 points)

(a) 9,499 (b) 9,500 (c) 98,500 (d) 99,612 (e) 9,950

ANSWER

(a) 9,000 (b) 10,000 (c) 99,000 (d) 100,000 (e) 10,000. One more digit: (b), (d) and (e).

SOLUTION

The deciding digit is the hundreds digit.

(a) It is 4, so 9,499 ≈ 9,000, still four digits.

(b) 9,500 is exactly halfway between 9,000 and 10,000, so it rounds up: 10,000, five digits.

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(c) 98,500 is exactly halfway between 98,000 and 99,000, so it rounds up: 99,000, still five digits.

(d) The hundreds digit is 6, so round up. The thousands digit 9 becomes ten, and the carry runs on through the ten thousands: 99,612 ≈ 100,000, six digits.

(e) The hundreds digit is 9, so round up. The thousands digit 9 becomes ten: 9,950 ≈ 10,000, five digits.

So (b), (d) and (e) gain a digit.

SCORING

2 points for the five roundings (1 point if four are right); 1 point for naming (b), (d) and (e) as the ones that gain a digit.

3. One symbol is missing from each Roman numeral. Write the symbol that goes in the box. (3 points)

(a) L ☐ XVI = 76 (b) D ☐ CC = 800 (c) M ☐ MXII = 1,912

ANSWER

(a) X (b) C (c) C

SOLUTION

(a) 76 = 70 + 6, which is LXX then VI, so LXXVI: the box is X.

(b) 800 = 500 + 300, which is D then CCC, so DCCC: the box is C.

(c) 1,912 = 1,000 + 900 + 10 + 2, which is M, CM, X, II, so MCMXII: the box is C, making the pair CM.

SCORING

1 point for each correct symbol: (a) X, (b) C, (c) C.

4. (2 points)

(a) Write 508,060 in word form.

(b) Write ninety thousand, four hundred two in standard form.

ANSWER

(a) five hundred eight thousand, sixty (b) 90,402

SOLUTION

(a) The thousands period is 508, five hundred eight, then "thousand". The ones period is 060, sixty. So five hundred eight thousand, sixty.

(b) Ninety is the thousands period, 90. Four hundred two must fill three places: 402. So 90,402.

SCORING

1 point for each part. Part (a) loses its point if it says "and" or drops "thousand".

5. Noah reads about two kings, King Henry VIII and King Louis XIV. (2 points)

(a) Write each king's number in our digits.

(b) Which of the two numerals uses a subtractive pair? Name the pair.

ANSWER

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(a) Henry 8, Louis 14 (b) XIV uses the pair IV.

SOLUTION

(a) VIII = 5 + 1 + 1 + 1 = 8. In XIV, I comes just before the larger V, so XIV = 10 + (5 − 1) = 14.

(b) XIV uses the pair IV. In VIII every symbol is the same size or smaller than the one before it, so every symbol is added.

SCORING

1 point for (a), both 8 and 14; 1 point for (b), XIV with the pair IV.

6. A science museum had 341,517 visitors last year. This year it had 30,000 more visitors than last year. (3 points)

(a) How many visitors did it have this year?

(b) Which digit changed? Explain why the other digits stayed the same.

ANSWER

(a) 371,517 visitors (b) The ten thousands digit changed, from 4 to 7.

SOLUTION

(a) 30,000 is 3 ten thousands and nothing in any other place. Add 3 to the ten thousands digit: 4 + 3 = 7. So this year there were 371,517 visitors.

(b) Only the ten thousands digit changed, from 4 to 7. Every other place had 0 added to it, and 7 is less than 10, so no place filled up and no trade was needed.

SCORING

2 points for (a): 1 for adding to the ten thousands place, 1 for the correct number. 1 point for (b): names the ten thousands digit and says the other places got nothing added (or that no trade happened).

7. Omar rounds 246,507 to the nearest ten thousand and writes 240,000. Is that right? If not, give the correct rounding and explain the mistake. (2 points)

ANSWER

No. 246,507 ≈ 250,000 to the nearest ten thousand. The thousands digit is 6, which is 5 or more, so the number rounds up; Omar only changed the digits after the ten thousands place to zeros.

SOLUTION

The neighbors for the nearest ten thousand are 240,000 and 250,000. The deciding digit is the thousands digit, 6. It is 5 or more, so the number is past the halfway mark and rounds up to the upper neighbor:

$$246{,}507 \approx 250{,}000$$

Omar wrote the lower neighbor. Turning the digits after the rounding place into zeros is only half the job; the deciding digit still has to be read to choose between the two neighbors.

SCORING

1 point for 250,000; 1 point for explaining that the thousands digit 6 is 5 or more, so the number rounds up (or that Omar chose the lower neighbor).

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8. A six-digit whole number rounds to 430,000 to the nearest ten thousand. Its thousands digit is 7. What are its hundred thousands digit and its ten thousands digit? Explain how you know. (2 points)

ANSWER

Hundred thousands digit 4, ten thousands digit 2. The thousands digit 7 means the number rounded up, so it sits between 420,000 and 430,000.

SOLUTION

The thousands digit is the deciding digit for the nearest ten thousand. It is 7, which is 5 or more, so the number rounded up to its upper neighbor. Its upper neighbor is 430,000, so its lower neighbor is 420,000, and the number is between them. Every number from 420,000 up to (not including) 430,000 starts with 42.

So the hundred thousands digit is 4 and the ten thousands digit is 2. (The number is somewhere from 427,000 to 427,999.)

SCORING

1 point for the digits 4 and 2; 1 point for explaining that a thousands digit of 7 rounds up, so the number lies between 420,000 and 430,000.

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