Answers - Place value to 10 000 000 and rounding

Year: Year 6

Answer to Question 1

a. Four million, three hundred and five thousand and sixty-two.
b. Eight million, seventy thousand, nine hundred.
c. **6 208 009**. There are no ten thousands, no hundreds and no tens, so each of those columns holds a zero.
d. **7 000 040**. Seven million and 4 tens, with zeros in every other column.

Ten million has eight digits: a 1 followed by seven zeros, which is **10 000 000**. Zara's number 1 000 000 is only one million, ten times too small.

Answer to Question 2

a. The 6 is in the ten thousands column, so its value is **60 000**.
b. The 4 is in the hundred thousands column, so its value is **400 000**.
c. The digit **2**.
d. 3 000 000 + 400 000 + 60 000 + 2 000 + 800 + 10 + 0 = **3 462 810**.
e. The 8 is in the ten thousands column (7 | 4 | 8 | 0 | 0 | 1 | 3), so its value is **80 000**.

Answer to Question 3

a. All four have seven digits and start with 3. Compare the hundred thousands: 4, 4, 5, 4. So 3 540 020 is the biggest. For the other three compare the ten thousands: 5, 0, 5. So 3 405 200 is the smallest. Finally 3 450 020 and 3 450 200 differ in the hundreds: 0 and 2. The order is **3 405 200, 3 450 020, 3 450 200, 3 540 020**.
b. 8 120 456 > 8 102 999 because 12 ten thousands is more than 10 ten thousands. 5 099 999 < 5 100 000, so the signs are **>** and **<**.
c. The differences from 3 500 000 are 94 800, 49 980, 49 800 and 40 020. The closest is **3 540 020**.

Answer to Question 4

a. The ones digit is 7, so round up: **48 640**.
b. Tens digit 3, round down: **48 600**. Hundreds digit 6, round up: **49 000**.
c. The thousands digit is 4, so round down: **350 000**. The ten thousands digit is 5, so round up: **400 000**.

d. The hundred thousands digit is 4, so round down: **6 000 000**.
e. The hundreds digit is 5, so round up. The 9s carry: **3 000 000**.

Answer to Question 5

a. 2 995 000 + 10 000 = **3 005 000** (the 9 carries into the hundred thousands).
b. The hundred thousands column holds 0, so exchange from the millions: 4 050 000 − 100 000 = **3 950 000**.
c. 899 500 + 1 000 = **900 500**.
d. 10 000 000 − 1 000 000 = **9 000 000**.
e. The sequence goes up by 100 000 each time: **2 650 000, 2 750 000, 2 850 000**.

Answer to Question 6

a. −3 + 8 = **5°C** (3 steps to reach 0, then 5 more).
b. **−10, −7, −2, 0, 4**. The further left, the smaller.
c. From −4 up to 0 is 4, then up to 6 is 6. The difference is 4 + 6 = **10**.
d. −12 + 5 = **−7 m**.
e. −9°C is colder, because −9 is further left than −2.

Answer to Question 7

a. Wembley (90 000), Old Trafford (74 310), Celtic Park (60 411), Villa Park (42 682).
b. **90 000, 74 000, 60 000, 43 000**.
c. **90 000, 70 000, 60 000, 40 000**.
d. 90 000 − 42 682 = **47 318**.
e. 74 310 to the nearest 10 000 is 70 000, so **yes**.

Answer to Question 8

a. Greatest: **Leeds**. Smallest: **Cardiff**.
b. Leeds 800 000, Sheffield 600 000, Bristol 500 000, Cardiff 400 000.
c. No two of them match, so **no**. Cardiff (362 000) rounds up to 400 000 and Bristol (472 400) rounds up to 500 000, so the four answers are all different.
d. Nearest million: **9 000 000** (the hundred thousands digit is 8, so round up). Nearest 100 000: **8 900 000** (the ten thousands digit is 6, so round up).
e. Each city has **six digits**. The London number has **seven digits**.

Answer to Question 9

a. Ben Nevis −11, Aberdeen −7, Inverness −4, Belfast −1, Manchester 2, Cardiff 5.
b. From −11 to 0 is 11, then to 5 is 5, so the difference is **16 degrees**.
c. 2 − 6 = **−4°C**.
d. −1 − 3 = −4, so **Inverness**.
e. −4 + 9 = 5, which is **above** freezing.

Answer to Question 10

a. Anything from 46 500 upwards rounds up to 47 000, so the smallest is **46 500**.
b. The largest is **47 499**, because 47 500 would round up to 48 000.
c. No. The crowd was at most 47 499, which is less than 47 500, so the stadium **could not** have been full.
d. Rounding to the nearest 100 narrows the range to between 46 950 and 47 049, which is a much smaller range than 46 500 to 47 499.

Answer to Question 11

a. Three hundred and eighty-four thousand, four hundred. One million, three hundred and ninety-one thousand.
b. Nearest 100 000: **1 400 000**. Nearest million: **1 000 000**.
c. **380 000**.
d. 40 075, 139 820, 384 400, 1 391 000.
e. 30 × 40 075 = 1 202 250, and 1 391 000 is more than that. **Yes**, Leo is correct. (1 391 000 ÷ 40 075 is about 34.7.)

Answer to Question 12

a. Lowest: **the submarine** (−150 m). Highest: **Ben Nevis** (1 345 m).
b. 1 345 + 2 = **1 347 m**.
c. −150 + 85 = **−65 m**, so 65 m below sea level.
d. 0 − 35 + 12 = **−23 m**.
e. **1 300 m**.

Answer to Question 13

a. Nearest 10 000: **3 480 000**. Nearest 100 000: **3 500 000**.
b. 4 000 000 − 3 482 719 = **517 281** copies.
c. 3 000 000 × 4 = **about £12 000 000**.
d. 3 482 719 + 517 281 = **4 000 000** exactly. The company reaches its target.

Answer to Question 14

a. Five hundred and twelve thousand, four hundred and eighty.
b. 2022: **420 000**, 2023: **490 000**, 2024: **510 000**.
c. **2024**: 512 480 − 415 230 = **97 250** more.
d. 420 000 + 490 000 + 510 000 = **1 420 000**.
e. Exact total 415 230 + 487 900 + 512 480 = 1 415 610. Needed: 1 500 000 − 1 415 610 = **84 390** more.

Answer to Question 15

a. Round 1: 1 200 000. Round 2: 2 400 000. Round 3: 2 000 000. Round 4: 800 000.
b. 1 200 000 + 2 400 000 + 2 000 000 + 800 000 = **6 400 000**.
c. 1 234 560 + 2 408 330 = 3 642 890. Adding 1 950 760 gives 5 593 650. Adding 849 999 gives **6 443 649**.
d. 6 443 649 − 6 400 000 = **43 649**.
e. 7 000 000 − 6 443 649 = **556 351** tickets. To the nearest 10 000 this is **560 000**.
f. The first two rounds sold 3 642 890 tickets. Half of 7 000 000 is 3 500 000, and 3 642 890 is bigger, so the journalist is **right**.

Answer to Question 16

a. Put the digits in descending order: **9 753 210**. Nine million, seven hundred and fifty-three thousand, two hundred and ten.
b. The smallest digit that is not 0 goes first: **1 023 579**.
c. 9 753 210 − 1 023 579 = **8 729 631**.
d. The ten thousands digit is 5, so round up: **9 800 000**.
e. For example **7 395 012** (7 is in the millions, 9 in the ten thousands). Many answers are possible, provided each digit is used once.

Answer to Question 17

a. 7 000 000 − 6 540 000 = **460 000** books.
b. 460 000 ÷ 46 000 = **10 weeks**.
c. The hundred thousands digit is 5, so it rounds up: **7 000 000**.
d. After 6 weeks: 6 540 000 + 6 × 46 000 = 6 540 000 + 276 000 = **6 816 000**. This is less than 7 000 000, so the target is **not** reached.
e. 10 000 000 − 6 540 000 = **3 460 000** books.

Answer to Question 18

a. To round to 3 800 000 to the nearest 100 000, the number must be 3 750 000 or more. (3 749 999 would round down to 3 700 000.)
b. To round to 3 750 000 to the nearest 10 000 the number must be less than 3 755 000. So the smallest is **3 750 000** and the largest is **3 754 999**.
c. The number must be at least 3 751 500, so the smallest is **3 751 500**.
d. **3 752 000** (or any number from 3 751 500 to 3 752 499) fits all three clues.

Answer to Question 19

a. Coldest: **Wednesday** (−21°C). Warmest: **Saturday** (−4°C).
b. From −12 to −21: **9 degrees**.
c. Wed to Thu: +6; Thu to Fri: +6; Fri to Sat: +5. The biggest rise is 6 degrees, which happened on **both Wed to Thu and Thu to Fri**.
d. Mon, Tue, Wed and Thu: **4 days**.
e. −7 + 10 = **3°C**.
f. Range = highest − lowest = −4 − (−21) = 17. She is **correct**.

Answer to Question 20

a. Millions 3; hundred thousands 6; ten thousands 5; thousands 6 − 3 = 3; hundreds 0; tens 4 (the only square between 1 and 9 is 4); ones 2. The code is **3 653 042**: three million, six hundred and fifty-three thousand and forty-two.
b. Nearest 1 000: **3 653 000**. Nearest 10 000: **3 650 000**. Nearest 100 000: **3 700 000**.
c. 3 653 042 + 346 958 = **4 000 000**. Check: 3 700 000 + 300 000 = 4 000 000. The estimate agrees.