1.3 Number: Standard Form and Rounding: Test Pack

Calculator allowed · about 55 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Round the number 3847 to:

(a) the nearest 10 **(1)**

(b) the nearest 100 **(1)**

(c) the nearest 1000 **(1)**

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2 Write these standard form numbers as ordinary numbers:

(a) 3.4×10^4 **(1)**

(b) 9.05×10^{-3} **(1)**

(c) 1.2×10^7 **(1)**

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3 Which of the following correctly represents 3200 in standard form?

- ☐ A) 32×10^2
- ☐ B) 3.2×10^3
- ☐ C) 0.32×10^4
- ☐ D) 3.2×10^2

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4 Priya buys three items costing £4.65, £12.20 and £7.85.

(a) Work out the total cost of the three items. **(1)**

.....

(b) Round the total cost to the nearest pound. **(1)**

(c) Using the exact total from part a, work out how much change Priya receives from a £30 note. **(1)**

.....

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5 Calculate the following, giving each answer in standard form.

(a) $(2.5 \times 10^3) \times (3 \times 10^4)$ **(2)**

.....

(b) $(6 \times 10^5) \times (4 \times 10^{-2})$ **(2)**

.....

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6 By rounding each number to 1 significant figure, estimate the value of (612 x 3.9) / 9.8. You must show your rounded values.

(2)

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7 Write these numbers in order, starting with the smallest: 3.6×10^4, 9.1×10^3, 4.2×10^{-2}, 3.6×10^{-3}

(3)

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8 A rocket travels at 6.6×10^7 metres per second for 5.8×10^5 seconds. How far does it travel?
Give your answer in standard form, with the number rounded to 3 significant figures.

(3)

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9 Round 0.0017126 to 1 significant figure.

(2)

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10 Round 18.873 to 1 decimal place.

(1)

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11 Write these numbers in order, largest first.
4.1×10^4, 9.0×10^5, 1.3×10^6, 6.8×10^{-4}

(2)

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12 Round 79.401 to 1 decimal place.

(1)

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13 Work out $(2 \times 10^{3}) \div (4 \times 10^{-3})$.
Give your answer in standard form.

(3)

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14 Work out $(2.4 \times 10^{5}) + (5 \times 10^{4})$. Give your answer in standard form.

(2)

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15 A grain of sand has a mass of 3×10^{-5} kg. Calculate the total mass, in kg, of 200000 grains of sand. Give your answer as an ordinary number.

(3)

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16 Light travels at a speed of 3×10^8 metres per second.

(a) Calculate how far light travels in 60 seconds. Give your answer in standard form. **(2)**

.....

(b) A spacecraft is 9×10^{10} metres from Earth. Work out how many seconds it would take light to travel this distance. Give your answer as an ordinary number. **(3)**

.....

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17 Amara estimates the value of (612 x 0.48) / 0.099 by rounding each number to 1 significant figure. Find Amara's estimate. You must show your rounded values.

(3)

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Mark scheme · 1.3 Number: Standard Form and Rounding: Test Pack

Question 1

(a) 3850 cao — **B1**

(a) Answer: **3850**

(b) 3800 cao — **B1**

(b) Answer: **3800**

(c) 4000 cao — **B1**

(c) Answer: **4000**

Question 2

(a) 34000 cao — **B1**

(a) Answer: **34000**

(b) 0.00905 cao — **B1**

(b) Answer: **0.00905**

(c) 12000000 cao — **B1**

(c) Answer: **12000000**

Question 3

selects B — **B1**

Answer: **B (3.2×10^3)**

Question 4

(a) £24.70 cao — **B1**

(a) Answer: **£24.70**

(b) £25 cao ft from part a — **B1**

(b) Answer: **£25**

(c) £5.30 cao ft from part a — **B1**

(c) Answer: **£5.30**

Question 5

(a) multiplies coefficients and adds indices: $2.5 \times 3 = 7.5$, 10^{3+4} — **M1**

(a) 7.5×10^7 cao — **A1**

(a) Answer: **7.5×10^7**

(b) multiplies coefficients and adds indices: $6 \times 4 = 24$, $10^{5+(-2)}$ — **M1**

(b) 2.4×10^4 cao (from 24×10^3 converted to standard form) — **A1**

(b) Answer: **2.4×10^4**

Question 6

correctly rounds all three values to 1 sf: 600, 4, 10 (oe) — **M1**

240 cao, from (600 x 4) / 10 — **A1**

Answer: **240**

Question 7

converts all four values to ordinary numbers or a comparable form (oe) — **M1**

correctly identifies the smallest and largest values — **M1**

fully correct order: 3.6×10^{-3}, 4.2×10^{-2}, 9.1×10^3, 3.6×10^4 cao — **A1**

Answer: **3.6×10^{-3}, 4.2×10^{-2}, 9.1×10^3, 3.6×10^4**

Question 8

chooses the correct operation (x or ÷) — **M1**

correct calculation with the numbers and the powers of 10 — **M1**

3.83×10^{13} cao — **A1**

Answer: **3.83×10^{13}**

Question 9

identifies the first significant figure and looks at the digit after the required place — **M1**

0.002 cao — **A1**

Answer: **0.002**

Question 10

18.9 cao — **B1**

Answer: **18.9**

Question 11

compares the powers of 10 first, or at least three numbers in order — **M1**

1.3×10^6, 9.0×10^5, 4.1×10^4, 6.8×10^{-4} cao — **A1**

Answer: **1.3×10^6, 9.0×10^5, 4.1×10^4, 6.8×10^{-4}**

Question 12

79.4 cao — **B1**

Answer: **79.4**

Question 13

$2 \div 4 = 0.5$ or powers subtracted — **M1**

both parts combined correctly — **M1**

5×10^5 cao — **A1**

Answer: **5×10^5**

Question 14

converts both numbers to the same power of 10 or to ordinary numbers: 240000 and 50000 (oe) — **M1**

2.9×10^5 cao — **A1**

Answer: **2.9×10^5**

Question 15

200000 written as 2×10^5 (oe) — **M1**

$(2 \times 10^5) \times (3 \times 10^{-5}) = 6 \times 10^0$ oe — **M1**

6 (kg) cao — **A1**

Answer: **6 kg**

Question 16

(a) correct method: $3 \times 10^8 \times 60$ (oe) — **M1**

(a) 1.8×10^{10} cao — **A1**

(a) Answer: **1.8×10^{10} metres**

(b) correct method: time = distance / speed = $(9 \times 10^{10}) / (3 \times 10^8)$ — **M1**

(b) correct standard form division: 3×10^2 (oe) — **M1**

(b) 300 seconds cao — **A1**

(b) Answer: **300 seconds**

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Question 17

rounds all three values correctly to 1 sf: 600, 0.5, 0.1 (oe)	**M1**
correct order of operations: (600 x 0.5) / 0.1	**M1**
3000 cao	**A1**

Answer: **3000**

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