1.14 Estimation and Checking: 2-hour Pack

Calculators not allowed · about 120 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Femi says that 31 x 78 = 2318. Use estimation to check, and then work out the correct answer if Femi is wrong.

(2)

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2 Mel estimates 4.1 ÷ 5.3 by rounding each number to 1 significant figure. Her estimate is 0.8.
Is her estimate an overestimate or an underestimate? Give a reason.

(2)

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3 By rounding each number to 1 significant figure, estimate the value of 9.88 x 22.

(2)

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4 By rounding each number to 1 significant figure, estimate the value of 11.5 x 6.7.

(2)

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5 Femi says that 29 x 64 = 1856. Use estimation to check, and then work out the correct answer if Femi is wrong.

(2)

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6 Mel estimates 5.2 x 6.8 by rounding each number to 1 significant figure. Her estimate is 35.
Is her estimate an overestimate or an underestimate? Give a reason.

(2)

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7 A school has £8690 to spend on buttons. One pack costs £0.62. Estimate how many packs it can buy, by rounding each number to 1 significant figure.

(3)

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8 By rounding each number to 1 significant figure, estimate the value of 64.3 ÷ 1.7.

(2)

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9 Estimate the value of (9.5 + 2.1) ÷ (6.1 - 4.8) by rounding each number to 1 significant figure.

(3)

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10 One pack of paper clips costs £0.62. A school buys 604 packs. Estimate the total cost by rounding each number to 1 significant figure.

(3)

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11 Mel estimates 6.5 ÷ 5.4 by rounding each number to 1 significant figure. Her estimate is 1.4.
Is her estimate an overestimate or an underestimate? Give a reason.

(2)

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12 One pack of buttons costs £0.36. A school buys 121 packs. Estimate the total cost by rounding each number to 1 significant figure.

(3)

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13 Ben says that 83 x 86 = 6138. Use estimation to check, and then work out the correct answer if Ben is wrong.

(2)

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14 Mel estimates 8.3 ÷ 4.1 by rounding each number to 1 significant figure. Her estimate is 2.
Is her estimate an overestimate or an underestimate? Give a reason.

(2)

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15 Ben says that 79 x 50 = 3940. Use estimation to check, and then work out the correct answer if Ben is wrong.

(2)

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16 A school has £4670 to spend on buttons. One pack costs £0.36. Estimate how many packs it can buy, by rounding each number to 1 significant figure.

(3)

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17 One pack of pencils costs £0.59. A school buys 502 packs. Estimate the total cost by rounding each number to 1 significant figure.

(3)

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18 Mel estimates 8.4 ÷ 8.3 by rounding each number to 1 significant figure. Her estimate is 1. Is her estimate an overestimate or an underestimate? Give a reason.

(2)

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19 Aisha says that 24 x 80 = 1920. Use estimation to check, and then work out the correct answer if Aisha is wrong.

(2)

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20 Mel estimates 8.5 ÷ 4.2 by rounding each number to 1 significant figure. Her estimate is 2.25.
Is her estimate an overestimate or an underestimate? Give a reason.

(2)

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21 Estimate the value of (3.6 x 5.8) ÷ 9.8 by rounding each number to 1 significant figure.

(3)

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22 Estimate the value of (7.7 x 6.2) ÷ 4.4 by rounding each number to 1 significant figure.

(3)

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23 Hamza says that 78 x 89 = 6842. Use estimation to check, and then work out the correct answer if Hamza is wrong.

(2)

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24 Hamza says that 84 x 91 = 7744. Use estimation to check, and then work out the correct answer if Hamza is wrong.

(2)

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25 One pack of buttons costs £0.83. A school buys 575 packs. Estimate the total cost by rounding each number to 1 significant figure.

(3)

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26 A school has £3720 to spend on pencils. One pack costs £0.49. Estimate how many packs it can buy, by rounding each number to 1 significant figure.

(3)

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27 Estimate the value of (7.6 x 2.5) ÷ 5.8 by rounding each number to 1 significant figure.

(3)

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28 Aisha says that 32 x 96 = 3072. Use estimation to check, and then work out the correct answer if Aisha is wrong.

(2)

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29 Mel estimates 4.5 x 9.2 by rounding each number to 1 significant figure. Her estimate is 45.
Is her estimate an overestimate or an underestimate? Give a reason.

(2)

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30 Estimate 3150 x 410 by rounding each number to 1 significant figure.

(2)

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31 Estimate 78600 - 19700 by rounding each number to 1 significant figure.

(2)

---

32 Estimate 0.68 x 0.031 by rounding each number to 1 significant figure.

(2)

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33 The exact value of 61 x 19 is 1159. Round each number to 1 significant figure to estimate the product, then state whether your estimate is an overestimate or an underestimate.

(2)

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34 Estimate 812 divided by 39 by rounding each number to 1 significant figure.

(3)

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35 A charity's till roll shows three donations: £1205.75, £640.20 and £640.55.

(a) Use 1 significant figure estimates for each amount to estimate the total. **(2)**

(b) The exact total is £2486.50. State, with a reason, whether the exact total is greater or less than your estimate. **(2)**

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36 Round 0.0362 to 1 significant figure.

(1)

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37 A delivery contains four boxes weighing 187 kg, 92 kg, 348 kg and 63 kg.

(a) Find a 1 significant figure estimate for the total mass. **(2)**

(b) Calculate the exact total mass and state whether the estimate is an overestimate or an underestimate. **(2)**

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38 Round 68400 to 1 significant figure.

(1)

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39 Round 7.14 to 1 significant figure.

(1)

40 Round 249 to 1 significant figure.

(1)

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Mark scheme · 1.14 Estimation and Checking: 2-hour Pack

Question 1

estimate such as 30 x 80 = 2400 or last digit check	M1
Incorrect, the correct answer is 2418	A1

Answer: **Incorrect, the correct answer is 2418**

Question 2

compares the rounded values with the originals (4.1 to 4, 5.3 to 5) or finds the exact value 0.774	M1
An overestimate with correct reason	A1

Answer: **An overestimate**

Question 3

both numbers rounded to 1 significant figure (10 and 20)	M1
200 cao	A1

Answer: **200**

Question 4

both numbers rounded to 1 significant figure (10 and 7)	M1
70 cao	A1

Answer: **70**

Question 5

estimate such as 30 x 60 = 1800 or last digit check	M1
Correct	A1

Answer: **Correct**

Question 6

compares the rounded values with the originals (5.2 to 5, 6.8 to 7) or finds the exact value 35.360	M1
An underestimate with correct reason	A1

Answer: **An underestimate**

Question 7

rounds to 9000 and 0.6	M1
9000 ÷ 0.6 attempted	M1
15000 cao	A1

Answer: **15000**

Question 8

both numbers rounded to 1 significant figure (60 and 2)	M1
30 cao	A1

Answer: **30**

Question 9

all numbers rounded to 1 significant figure	M1
correct calculation with rounded values, eg (10 + 2) ÷ (6 - 5)	M1
12 cao	A1

Answer: **12**

Question 10

rounds to 0.6 and 600	M1
0.6 x 600 attempted	M1
£360 cao	A1

Answer: **£360**

Question 11

compares the rounded values with the originals (6.5 to 7, 5.4 to 5) or finds the exact value 1.204	M1
An overestimate with correct reason	A1

Answer: **An overestimate**

Question 12

rounds to 0.4 and 100	M1
0.4 x 100 attempted	M1
£40 cao	A1

Answer: **£40**

Question 13

estimate such as 80 x 90 = 7200, so 6138 is too small	M1
Incorrect, the correct answer is 7138	A1

Answer: **Incorrect, the correct answer is 7138**

Question 14

compares the rounded values with the originals (8.3 to 8, 4.1 to 4) or finds the exact value 2.024	M1
An underestimate with correct reason	A1

Answer: **An underestimate**

Question 15

estimate such as 80 x 50 = 4000 or last digit check	M1
Incorrect, the correct answer is 3950	A1

Answer: **Incorrect, the correct answer is 3950**

Question 16

rounds to 5000 and 0.4	M1
5000 ÷ 0.4 attempted	M1
12500 cao	A1

Answer: **12500**

Question 17

rounds to 0.6 and 500	M1
0.6 x 500 attempted	M1
£300 cao	A1

Answer: **£300**

Question 18

compares the rounded values with the originals (8.4 to 8, 8.3 to 8) or finds the exact value 1.012	M1
An underestimate with correct reason	A1

Answer: **An underestimate**

Question 19

estimate such as 20 x 80 = 1600 or last digit check	M1
Correct	A1

Answer: **Correct**

Question 20

compares the rounded values with the originals (8.5 to 9, 4.2 to 4) or finds the exact value 2.024	M1
An overestimate with correct reason	A1

Answer: **An overestimate**

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Question 21

all numbers rounded to 1 significant figure	M1
correct calculation with rounded values, eg 4 x 6 ÷ 10	M1
2.4 cao	A1

Answer: **2.4**

Question 22

all numbers rounded to 1 significant figure	M1
correct calculation with rounded values, eg 8 x 6 ÷ 4	M1
12 cao	A1

Answer: **12**

Question 23

estimate such as 80 x 90 = 7200 or last digit check	M1
Incorrect, the correct answer is 6942	A1

Answer: **Incorrect, the correct answer is 6942**

Question 24

estimate such as 80 x 90 = 7200 or last digit check	M1
Incorrect, the correct answer is 7644	A1

Answer: **Incorrect, the correct answer is 7644**

Question 25

rounds to 0.8 and 600	M1
0.8 x 600 attempted	M1
£480 cao	A1

Answer: **£480**

Question 26

rounds to 4000 and 0.5	M1
4000 ÷ 0.5 attempted	M1
8000 cao	A1

Answer: **8000**

Question 27

all numbers rounded to 1 significant figure	M1
correct calculation with rounded values, eg 8 x 3 ÷ 6	M1
4 cao	A1

Answer: **4**

Question 28

estimate such as 30 x 100 = 3000 or last digit check	M1
Correct	A1

Answer: **Correct**

Question 29

compares the rounded values with the originals (4.5 to 5, 9.2 to 9) or finds the exact value 41.400	M1
An overestimate with correct reason	A1

Answer: **An overestimate**

Question 30

both numbers rounded to 1 s.f. correctly: 3150 -> 3000 and 410 -> 400	M1
correct estimated product 1200000 cao	A1

Answer: **1200000**

Question 31

both numbers rounded to 1 s.f. correctly: 78600 -> 80000 and 19700 -> 20000	M1
correct estimated difference 60000 cao	A1

Answer: **60000**

Question 32

both numbers rounded to 1 s.f. correctly: 0.68 -> 0.7 and 0.031 -> 0.03	M1
correct estimated product 0.021 cao	A1

Answer: **0.021**

Question 33

correct estimate using 1 s.f. values: 60 x 20 = 1200	M1
correctly state overestimate, since 1200 > 1159 cao	A1

Answer: **1200; overestimate**

Question 34

round 812 to 1 s.f. correctly: 812 -> 800	M1
round 39 to 1 s.f. correctly and set up the division: 39 -> 40, 800 / 40	M1
correct estimate 20 cao	A1

Answer: **20**

Question 35

(a) all three amounts rounded to 1 s.f. correctly: 1205.75 -> 1000, 640.20 -> 600, 640.55 -> 600	M1
(a) correct estimated total 2200 cao	A1

(a) Answer: **2200**

(b) recognise every amount was rounded down to reach the estimate	M1
(b) correctly state the exact total (2486.50) is greater than the estimate (2200), because each amount was rounded down cao	A1

(b) Answer: **Greater than the estimate, because every amount was rounded down**

Question 36

0.04 cao	B1

Answer: **0.04**

Question 37

(a) all four masses rounded to 1 s.f. correctly: 187 -> 200, 92 -> 90, 348 -> 300, 63 -> 60	M1
(a) correct estimated total 650 cao	A1

(a) Answer: **650**

(b) correct exact total: 187 + 92 + 348 + 63 = 690	M1
(b) correctly state underestimate, since 650 < 690 cao	A1

(b) Answer: **690; underestimate**

Question 38

70000 cao	B1

Answer: **70000**

Question 39

7 cao	B1

Answer: **7**

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Question 40

200 cao **B1**

Answer: **200**

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