1.14 Estimation and Checking: 30-minute Pack

Calculators not allowed · about 30 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 A school has £7500 to spend on stickers. One pack costs £0.79. Estimate how many packs it can buy, by rounding each number to 1 significant figure.

(3)

2 A school has £2890 to spend on pencils. One pack costs £0.85. Estimate how many packs it can buy, by rounding each number to 1 significant figure.

(3)

3 By rounding each number to 1 significant figure, estimate the value of 9.68 ÷ 1.7.

(2)

4 By rounding each number to 1 significant figure, estimate the value of 68.4 x 7.7.

(2)

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5 Mel estimates 3 ÷ 3.5 by rounding each number to 1 significant figure. Her estimate is 0.75.
Is her estimate an overestimate or an underestimate? Give a reason.

(2)

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6 Ben says that 43 x 78 = 3354. Use estimation to check, and then work out the correct answer if Ben is wrong.

(2)

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7 Estimate the value of 0.372 + 0.045 using 1 significant figure then give an appropriate check by computing the exact sum and comparing.

(a) Estimate the sum to 1 s.f. **(2)**

(b) Calculate the exact sum and say whether the estimate was an overestimate or underestimate. **(2)**

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8 Round each measurement to 1 significant figure to give an approximate distance.

(a) Round 3.8 km to 1 significant figure. **(1)**

(b) Round 0.67 km to 1 significant figure. **(1)**

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9 A school books 3 coaches at £495 each. Estimate the total cost by rounding 495 to 1 significant figure, then compare your estimate with the exact total cost of £1485. State whether the estimate is an overestimate or an underestimate.

(3)

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Mark scheme · 1.14 Estimation and Checking: 30-minute Pack

Question 1

rounds to 8000 and 0.8	M1
8000 ÷ 0.8 attempted	M1
10000 cao	A1

Answer: **10000**

Question 2

rounds to 3000 and 0.9	M1
3000 ÷ 0.9 attempted	M1
about 3333 packs (accept 3300 to 3334, or 10000/3 = 3333.3...)	A1

Answer: **About 3333 packs (3000 ÷ 0.9 = 3333.3...)**

Question 3

both numbers rounded to 1 significant figure (10 and 2)	M1
5 cao	A1

Answer: **5**

Question 4

both numbers rounded to 1 significant figure (70 and 8)	M1
560 cao	A1

Answer: **560**

Question 5

compares the rounded values with the originals (3 to 3, 3.5 to 4) or finds the exact value 0.857	M1
An underestimate with correct reason	A1

Answer: **An underestimate**

Question 6

estimate such as 40 x 80 = 3200 or last digit check	M1
Correct	A1

Answer: **Correct**

Question 7

(a) both numbers rounded to 1 s.f. correctly, e.g. 0.372 -> 0.4 and 0.045 -> 0.05	M1
(a) a consistent estimate given from the rounded values, e.g. 0.4 + 0.05 = 0.45 cao	A1

(a) Answer: **0.45**

(b) correct exact sum 0.417	M1
(b) correctly state whether estimate is an overestimate or underestimate (here 0.45 > 0.417 so overestimate) cao	A1

(b) Answer: **0.417; overestimate**

Question 8

(a) 4 km cao	B1

(a) Answer: **4 km**

(b) 0.7 km cao	B1

(b) Answer: **0.7 km**

Question 9

round 495 to 1 s.f. correctly: 495 -> 500	M1
correct estimated total: 3 x 500 = 1500	M1
correctly state overestimate, since 1500 > 1485 cao	A1

Answer: **Estimate 1500; overestimate**

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