3.3 Estimating: 30-minute Pack

EDEXCEL 1MA1 · Calculator allowed · about 30 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Round 0.0067 to 1 significant figure.

(Total for Question 1 is 1 mark)

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2 Round 46 to the nearest 10.

(Total for Question 2 is 1 mark)

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3 Round each number to 1 significant figure.

(a) 683 **(1)**

(b) 0.0456 **(1)**

(c) 5.48 **(1)**

(d) 149.6 **(1)**

(Total for Question 3 is 4 marks)

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4 Round 0.995 to 1 significant figure.

(Total for Question 4 is 1 mark)

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5 Round 3.76 to 1 decimal place.

(Total for Question 5 is 1 mark)

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6 A recipe for 8 people uses 3.85 kg of flour. By rounding suitable values to 1 significant figure, estimate the amount of flour needed for 31 people.

(Total for Question 6 is 3 marks)

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7 James is organising a coach trip for 187 people. Each coach holds 48 seats. By rounding both numbers to 1 significant figure, find an estimate for the number of coaches needed.

(Total for Question 7 is 2 marks)

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8 A train travels at an average speed of 68 km/h for 3.9 hours. By rounding each number to 1 significant figure, estimate the distance travelled.

(Total for Question 8 is 2 marks)

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9 By rounding each number to 1 significant figure, put a ring around the best estimate for 0.612 / 0.19

- ☐ A) 3
- ☐ B) 30
- ☐ C) 0.3
- ☐ D) 6

(Total for Question 9 is 1 mark)

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10 By rounding each number to 1 significant figure, work out an estimate for 78 x 213

(Total for Question 10 is 2 marks)

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11 A car journey of 315 km takes 3 hours 12 minutes. The driver records the journey time with a stopwatch to the nearest minute. Estimate the average speed in km/h and give an upper and lower estimate for the speed using bounds from the timing measurement. Give answers to 3 significant figures.

(Total for Question 11 is 5 marks)

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Mark scheme · 3.3 Estimating: 30-minute Pack

Question 1

0.007 cao **B1**

Answer: 0.007 (to 1 s.f.)

Question 2

50 cao **B1**

Answer: 50 (nearest 10). Check: 46 rounds up to 50 because the units digit 6 ≥ 5.

Question 3

(a) 700 cao **B1**

(a) Answer: 700

(b) 0.05 cao **B1**

(b) Answer: 0.05

(c) 5 cao **B1**

(c) Answer: 5

(d) 100 cao **B1**

(d) Answer: 100

Question 4

1 cao **B1**

Answer: 1

Question 5

3.8 cao **B1**

Answer: 3.8 (1 decimal place). Check: 3.76 -> 3.8 because hundredths 6 ≥ 5.

Question 6

rounding 3.85 to 4 and 31 to 30 **M1**

dep, 4 x (30 / 8) **M1**

15 (kg), awrt 15 **A1**

Answer: 15 kg

Question 7

rounding both values to 1 sf, 200 and 50 **M1**

4 cao **A1**

Answer: 4 coaches

Question 8

rounding both values to 1 sf, 70 and 4 **M1**

280 (km) cao **A1**

Answer: 280 km

Question 9

A (0.6 / 0.2 = 3) **B1**

Answer: A) 3

Question 10

rounding both values to 1 sf, 80 and 200 **M1**

16000 cao **A1**

Answer: 16000

Question 11

convert recorded time 3 h 12 min = 192 min and use nearest-minute bounds: 191.5 min to 192.5 min (convert to hours) **M1**

compute central estimate speed = 315 / 3.2 = 98.4375 km/h **M1**

use bounds to find lower and upper speeds: speed_lower = 315 / (192.5/60), speed_upper = 315 / (191.5/60) **M1**

compute numerical lower and upper speeds (method shown) **M1**

final answers to 3 sf: estimate 98.4 km/h, lower 98.2 km/h, upper 98.7 km/h cao **A1**

Answer:Central estimate 98.4 km/h, lower estimate 98.2 km/h, upper estimate 98.7 km/h.

Working: 3 h 12 min = 192 min = 3.2 h so central = 315/3.2 = 98.4375 -> 98.4 (3 sf). Time bounds: 191.5 min (3.1916667 h) gives speed = 315/3.1916667 = 98.6945 -> 98.7 (3 sf). 192.5 min (3.2083333 h) gives speed = 315/3.2083333 = 98.1818 -> 98.2 (3 sf).

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