2.3 Ratio and Proportion: 1-hour Pack

ISEB CE.M3 · Calculator allowed · about 60 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 On a map with scale 1:50000, two villages near Aberdeen are 1.1 cm apart. What is the real distance between them, in kilometres?

- ☐ A) 0.055 km
- ☐ B) 55000 km
- ☐ C) 0.55 km
- ☐ D) 2.2 km
- ☐ E) 5.5 km

---

2 Kiran, Amira and Kwame share 51 marbles in the ratio 1:9:7. How many does the person with the smallest share get?

- ☐ A) 6
- ☐ B) 17
- ☐ C) 48
- ☐ D) 51
- ☐ E) 3

---

3 A train travels at an average speed of 12 km/h for 20 min. How far does it travel?

- ☐ A) 240 km
- ☐ B) 4 km
- ☐ C) 32 km
- ☐ D) 2.4 km
- ☐ E) 1.67 km

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4 The rice comes in five sizes. Which size is the best value for money?

- ☐ A) 300 g for £1
- ☐ B) 750 g for £2.48
- ☐ C) 500 g for £1.50
- ☐ D) 250 g for £0.87
- ☐ E) 600 g for £1.96

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5 A car travels at a constant speed. It travels 108 miles in 2 hours.

(a) Work out the speed of the car, in miles per hour. **(1)**

.....

(b) Using a proportion method, work out how long the car takes to travel 270 miles at the same speed. **(3)**

.....

---

6 10 painters take 66 days to finish a job, all working at the same rate. How many days would 11 painters take?

- ☐ A) 60 days
- ☐ B) 660 days
- ☐ C) 67 days
- ☐ D) 726 days
- ☐ E) 1 days

---

7 On a map with scale 1:100000, two villages near Aberdeen are 9.8 cm apart. What is the real distance between them, in kilometres?

- ☐ A) 0.98 km
- ☐ B) 980 km
- ☐ C) 98 km
- ☐ D) 9.8 km
- ☐ E) 980000 km

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8 The ratio of red paint to white paint is 1:5. There are 12 litres of red paint. How many litres of white paint are there?

- [ ] A) 84
- [ ] B) 12
- [ ] C) 7
- [ ] D) 16
- [ ] E) 60

---

9 A car drives 30 km at 40 km/h, then 60 km at 90 km/h. What is its average speed for the whole journey, in km/h?

- [ ] A) 67.0 km/h
- [ ] B) 1.4 km/h
- [ ] C) 63.5 km/h
- [ ] D) 73.3 km/h
- [ ] E) 65.0 km/h

---

10 The paint comes in five sizes. Which size is the best value for money?

- [ ] A) 2000 ml for £11.55
- [ ] B) 1500 ml for £8.67
- [ ] C) 330 ml for £1.85
- [ ] D) 500 ml for £2.65
- [ ] E) 750 ml for £4.21

---

11 A recipe for 4 people uses 12 g of butter. How many grams of butter are needed for 8 people?

- [ ] A) 8 g
- [ ] B) 24 g
- [ ] C) 4 g
- [ ] D) 96 g
- [ ] E) 3 g

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12 On a map with scale 1:50000, two villages near Belfast are 5.1 cm apart. What is the real distance between them, in kilometres?

- [ ] A) 25.5 km
- [ ] B) 255000 km
- [ ] C) 255 km
- [ ] D) 10.2 km
- [ ] E) 2.55 km

---

13 The ratio of red paint to white paint is 8:3. There are 18 litres of white paint. What is the difference between the two amounts, in litres?

- [ ] A) 6
- [ ] B) 30
- [ ] C) 198
- [ ] D) 26
- [ ] E) 10

---

14 Chloe and Dev share £34 in the ratio 8:9. How much is the largest share?

- [ ] A) £2
- [ ] B) £153
- [ ] C) £18
- [ ] D) £16
- [ ] E) £20

---

15 A coach travels at an average speed of 60 km/h for 1 h 30 min. How far does it travel?

- [ ] A) 78 km
- [ ] B) 5400 km
- [ ] C) 2/3 km
- [ ] D) 90 km
- [ ] E) 1.50 km

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16 A recipe for 6 people uses 54 g of butter. How many grams of butter are needed for 14 people?

- [ ] A) 324 g
- [ ] B) 62 g
- [ ] C) 9 g
- [ ] D) 756 g
- [ ] E) 126 g

---

17 On a map with scale 1:25000, two villages near Aberdeen are 5.7 cm apart. What is the real distance between them, in kilometres?

- [ ] A) 142500 km
- [ ] B) 14.25 km
- [ ] C) 22.8 km
- [ ] D) 1.425 km
- [ ] E) 142.5 km

---

18 The ratio of flour to butter is 1:7. There are 11 g of flour. How many g of butter are there?

- [ ] A) 4
- [ ] B) 99
- [ ] C) 77
- [ ] D) 88
- [ ] E) 11

---

19 Rhys and Archie share £140 in the ratio 6:1. How much is the largest share?

- [ ] A) £20
- [ ] B) £120
- [ ] C) £100
- [ ] D) £140
- [ ] E) £420

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20 A delivery van travels 210 km in 3 h 30 min. What is its average speed?

- [ ] A) 60 km/h
- [ ] B) 735 km/h
- [ ] C) 213.5 km/h
- [ ] D) 0.02 km/h
- [ ] E) 700/11 km/h

---

21 The sugar comes in five sizes. Which size is the best value for money?

- [ ] A) 1000 g for £4.26
- [ ] B) 200 g for £0.86
- [ ] C) 400 g for £1.69
- [ ] D) 800 g for £3.44
- [ ] E) 500 g for £2.05

---

22 12 painters take 15 days to finish a job, all working at the same rate. How many days would 30 painters take?

- [ ] A) 33 days
- [ ] B) 180 days
- [ ] C) 6 days
- [ ] D) 18 days
- [ ] E) 450 days

---

23 On a map with scale 1:20000, two villages near Aberdeen are 6.6 cm apart. What is the real distance between them, in kilometres?

- [ ] A) 1.32 km
- [ ] B) 132000 km
- [ ] C) 33 km
- [ ] D) 132 km
- [ ] E) 13.2 km

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24 The ratio of sand to cement is 5:8. There are 55 kg of sand. What is the difference between the two amounts, in kg?

- [ ] A) 58
- [ ] B) 33
- [ ] C) 143
- [ ] D) 198
- [ ] E) 63

---

25 Dev and Hamza share 24 marbles in the ratio 7:1. What is the difference between the largest and smallest shares?

- [ ] A) 72
- [ ] B) 21
- [ ] C) 18
- [ ] D) 15
- [ ] E) 3

---

26 A coach travels at an average speed of 36 km/h for 1 h 30 min. How far does it travel?

- [ ] A) 3240 km
- [ ] B) 32.4 km
- [ ] C) 0.4 km
- [ ] D) 46.8 km
- [ ] E) 54 km

---

27 The paint comes in five sizes. Which size is the best value for money?

- [ ] A) 330 ml for £1.11
- [ ] B) 250 ml for £0.83
- [ ] C) 1000 ml for £3.49
- [ ] D) 500 ml for £1.60
- [ ] E) 750 ml for £2.62

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28 A recipe for 10 people uses 1250 g of flour. How many grams of flour are needed for 8 people?

- [ ] A) 1252 g
- [ ] B) 12500 g
- [ ] C) 1000 g
- [ ] D) 125 g
- [ ] E) 2 g

---

29 A walk near Aberdeen is 6.9 km long. How long is it on a map with scale 1:10000, in centimetres?

- [ ] A) 69000 cm
- [ ] B) 690 cm
- [ ] C) 6.9 cm
- [ ] D) 69 cm
- [ ] E) 0.69 cm

---

30 The ratio of red counters to blue counters is 3:7. There are 14 blue counters. How many red counters are there?

- [ ] A) 34
- [ ] B) 6
- [ ] C) 140
- [ ] D) 20
- [ ] E) 2

---

31 A car drives 90 km at 30 km/h, then 60 km at 90 km/h. What is its average speed for the whole journey, in km/h?

- [ ] A) 3.7 km/h
- [ ] B) 60.0 km/h
- [ ] C) 54.0 km/h
- [ ] D) 36.9 km/h
- [ ] E) 40.9 km/h

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32 The flour comes in five sizes. Which size is the best value for money?

- [ ] A) 200 g for £0.98
- [ ] B) 250 g for £1.28
- [ ] C) 300 g for £1.45
- [ ] D) 500 g for £2.20
- [ ] E) 600 g for £3.04

---

33 2 gardeners take 18 days to finish a job, all working at the same rate. How many days would 4 gardeners take?

- [ ] A) 16 days
- [ ] B) 2 days
- [ ] C) 36 days
- [ ] D) 72 days
- [ ] E) 9 days

---

34 On a map with scale 1:20000, two villages near Oxford are 7.1 cm apart. What is the real distance between them, in kilometres?

- [ ] A) 14.2 km
- [ ] B) 0.142 km
- [ ] C) 1.42 km
- [ ] D) 142 km
- [ ] E) 35.5 km

---

35 The ratio of flour to butter is 9:8. There are 24 g of butter. What is the difference between the two amounts, in g?

- [ ] A) 216
- [ ] B) 3
- [ ] C) 33
- [ ] D) 48
- [ ] E) 75

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36 Chloe, Freddie and Rhys share 160 stickers in the ratio 8:5:7. What is the difference between the largest and smallest shares?

- [ ] A) 24
- [ ] B) 16
- [ ] C) 104
- [ ] D) 160
- [ ] E) 8

---

37 A runner travels at an average speed of 12 km/h for 1 h 30 min. How far does it travel?

- [ ] A) 7.50 km
- [ ] B) 15.6 km
- [ ] C) 2/15 km
- [ ] D) 18 km
- [ ] E) 10.8 km

---

38 4 builders take 42 days to finish a job, all working at the same rate. How many days would 24 builders take?

- [ ] A) 1008 days
- [ ] B) 62 days
- [ ] C) 7 days
- [ ] D) 20 days
- [ ] E) 252 days

---

39 A walk near Swansea is 2.5 km long. How long is it on a map with scale 1:20000, in centimetres?

- [ ] A) 125 cm
- [ ] B) 1.25 cm
- [ ] C) 0.5 cm
- [ ] D) 0.125 cm
- [ ] E) 12.5 cm

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40 The ratio of boys to girls is 9:8. There are 80 girls. How many boys are there?

- [ ] A) 71
- [ ] B) 90
- [ ] C) 720
- [ ] D) 10
- [ ] E) 250

---

41 Jack and Nia share 224 marbles in the ratio 5:9. How many does the person with the smallest share get?

- [ ] A) 96
- [ ] B) 80
- [ ] C) 16
- [ ] D) 560
- [ ] E) 64

---

42 A cyclist travels 90 km at an average speed of 40 km/h. How long does the journey take?

- [ ] A) 2 h 5 min
- [ ] B) 2.15 h
- [ ] C) 2 h 15 min
- [ ] D) 0.44 h
- [ ] E) 2 h 25 min

---

43 The sugar comes in five sizes. Which size is the best value for money?

- [ ] A) 300 g for £1.59
- [ ] B) 250 g for £1.40
- [ ] C) 600 g for £3.43
- [ ] D) 200 g for £1.11
- [ ] E) 800 g for £4.58

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44 A recipe for 10 people uses 50 g of butter. How many grams of butter are needed for 3 people?

- [ ] A) 150 g
- [ ] B) 7 g
- [ ] C) 500 g
- [ ] D) 15 g
- [ ] E) 5 g

---

45 The ratio of flour to butter is 7:4. There are 12 g of butter. What is the difference between the two amounts, in g?

- [ ] A) 9
- [ ] B) 15
- [ ] C) 3
- [ ] D) 84
- [ ] E) 5

---

46 Grace and Fergus share £90 in the ratio 2:7. How much is the smallest share?

- [ ] A) £10
- [ ] B) £20
- [ ] C) £90
- [ ] D) £70
- [ ] E) £30

---

47 A delivery van travels 72 km in 3 h. What is its average speed?

- [ ] A) 69 km/h
- [ ] B) 0.04 km/h
- [ ] C) 216 km/h
- [ ] D) 0.4 km/h
- [ ] E) 24 km/h

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48 The flour comes in five sizes. Which size is the best value for money?

- [ ] A) 500 g for £1.98
- [ ] B) 400 g for £1.61
- [ ] C) 1000 g for £3.96
- [ ] D) 600 g for £2.22
- [ ] E) 200 g for £0.79

---

49 A recipe for 3 people uses 300 g of flour. How many grams of flour are needed for 5 people?

- [ ] A) 298 g
- [ ] B) 2 g
- [ ] C) 500 g
- [ ] D) 1500 g
- [ ] E) 180 g

---

50 On a map with scale 1:100000, two villages near Durham are 0.9 cm apart. What is the real distance between them, in kilometres?

- [ ] A) 0.9 km
- [ ] B) 9 km
- [ ] C) 90000 km
- [ ] D) 90 km
- [ ] E) 0.09 km

---

51 The ratio of fiction books to non-fiction books is 4:11. There are 55 non-fiction books. How many fiction books are there?

- [ ] A) 110
- [ ] B) 5
- [ ] C) 825
- [ ] D) 20
- [ ] E) 62

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52 Dev and Tom share £105 in the ratio 4:3. How much is the smallest share?

- [ ] A) £157.5
- [ ] B) £30
- [ ] C) £45
- [ ] D) £60
- [ ] E) £15

---

53 A runner travels at an average speed of 45 km/h for 40 min. How far does it travel?

- [ ] A) 85 km
- [ ] B) 30 km
- [ ] C) 18 km
- [ ] D) 1800 km
- [ ] E) 1.125 km

---

54 The paint comes in five sizes. Which size is the best value for money?

- [ ] A) 750 ml for £4.13
- [ ] B) 2000 ml for £11.23
- [ ] C) 1500 ml for £8.50
- [ ] D) 400 ml for £2.27
- [ ] E) 500 ml for £2.70

---

55 2 gardeners take 12 days to finish a job, all working at the same rate. How many days would 6 gardeners take?

- [ ] A) 6 days
- [ ] B) 4 days
- [ ] C) 16 days
- [ ] D) 72 days
- [ ] E) 36 days

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56 On a map with scale 1:100000, two villages near Belfast are 5.4 cm apart. What is the real distance between them, in kilometres?

- [ ] A) 54 km
- [ ] B) 0.54 km
- [ ] C) 540 km
- [ ] D) 5.4 km
- [ ] E) 540000 km

---

57 The ratio of boys to girls is 6:7. There are 84 boys. How many girls are there?

- [ ] A) 98
- [ ] B) 266
- [ ] C) 182
- [ ] D) 77
- [ ] E) 168

---

58 Amira, Rhys and Hamza share 168 marbles in the ratio 8:9:7. How many does the person with the smallest share get?

- [ ] A) 42
- [ ] B) 56
- [ ] C) 49
- [ ] D) 119
- [ ] E) 7

---

59 A train travels at an average speed of 24 km/h for 45 min. How far does it travel?

- [ ] A) 10.8 km
- [ ] B) 1.88 km
- [ ] C) 1080 km
- [ ] D) 8/15 km
- [ ] E) 18 km

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60 A recipe for 5 people uses 1125 g of butter. How many grams of butter are needed for 6 people?

- [ ] A) 6750 g
- [ ] B) 1350 g
- [ ] C) 5625 g
- [ ] D) 1126 g
- [ ] E) 937.5 g

---

61 On a map with scale 1:25000, two villages near Aberdeen are 10.8 cm apart. What is the real distance between them, in kilometres?

- [ ] A) 27 km
- [ ] B) 0.27 km
- [ ] C) 43.2 km
- [ ] D) 2.7 km
- [ ] E) 270 km

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Mark scheme · 2.3 Ratio and Proportion: 1-hour Pack

Question 1

C cao (0.55 km); multiply by the scale, then change cm to km **B1**

Answer: C) 0.55 km

Question 2

E cao (3); 51 ÷ 17 = 3 per part **B1**

Answer: E) 3

Question 3

B cao (4 km); speed = distance / time; change minutes to hours **B1**

Answer: B) 4 km

Question 4

C cao (500 g for £1.50); compare the price per unit for each size **B1**

Answer: C) 500 g for £1.50

Question 5

(a) 54 mph cao **B1**

(a) Answer: 54 mph

(b) correct proportion set up, e.g. 108 miles : 2 hours = 270 miles : t hours oe **M1**

(b) t = 270 x 2 / 108 oe, dependent on previous method **M1**

(b) 5 hours cao **A1**

(b) Answer: 5 hours

Question 6

A cao (60 days); total work stays the same: workers x days **B1**

Answer: A) 60 days

Question 7

D cao (9.8 km); multiply by the scale, then change cm to km **B1**

Answer: D) 9.8 km

Question 8

E cao (60); one part = 12 **B1**

Answer: E) 60

Question 9

C cao (63.5 km/h); speed = distance / time; change minutes to hours **B1**

Answer: C) 63.5 km/h

Question 10

D cao (500 ml for £2.65); compare the price per unit for each size **B1**

Answer: D) 500 ml for £2.65

Question 11

B cao (24 g); find the amount for one person, then multiply **B1**

Answer: B) 24 g

Question 12

E cao (2.55 km); multiply by the scale, then change cm to km **B1**

Answer: E) 2.55 km

Question 13

B cao (30); one part = 6 **B1**

Answer: B) 30

Question 14

C cao (£18); 34 ÷ 17 = 2 per part **B1**

Answer: C) £18

Question 15

D cao (90 km); speed = distance / time; change minutes to hours **B1**

Answer: D) 90 km

Question 16

E cao (126 g); find the amount for one person, then multiply **B1**

Answer: E) 126 g

Question 17

D cao (1.425 km); multiply by the scale, then change cm to km **B1**

Answer: D) 1.425 km

Question 18

C cao (77); one part = 11 **B1**

Answer: C) 77

Question 19

B cao (£120); 140 ÷ 7 = 20 per part **B1**

Answer: B) £120

Question 20

A cao (60 km/h); speed = distance / time; change minutes to hours **B1**

Answer: A) 60 km/h

Question 21

E cao (500 g for £2.05); compare the price per unit for each size **B1**

Answer: E) 500 g for £2.05

Question 22

C cao (6 days); total work stays the same: workers x days **B1**

Answer: C) 6 days

Question 23

A cao (1.32 km); multiply by the scale, then change cm to km **B1**

Answer: A) 1.32 km

Question 24

B cao (33); one part = 11 **B1**

Answer: B) 33

Question 25

C cao (18); 24 ÷ 8 = 3 per part **B1**

Answer: C) 18

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Question 26

E cao (54 km); speed = distance / time; change minutes to hours **B1**

Answer: E) 54 km

Question 27

D cao (500 ml for £1.60); compare the price per unit for each size **B1**

Answer: D) 500 ml for £1.60

Question 28

C cao (1000 g); find the amount for one person, then multiply **B1**

Answer: C) 1000 g

Question 29

D cao (69 cm); change km to cm, then divide by the scale **B1**

Answer: D) 69 cm

Question 30

B cao (6); one part = 2 **B1**

Answer: B) 6

Question 31

E cao (40.9 km/h); speed = distance / time; change minutes to hours **B1**

Answer: E) 40.9 km/h

Question 32

D cao (500 g for £2.20); compare the price per unit for each size **B1**

Answer: D) 500 g for £2.20

Question 33

E cao (9 days); total work stays the same: workers x days **B1**

Answer: E) 9 days

Question 34

C cao (1.42 km); multiply by the scale, then change cm to km **B1**

Answer: C) 1.42 km

Question 35

B cao (3); one part = 3 **B1**

Answer: B) 3

Question 36

A cao (24); 160 ÷ 20 = 8 per part **B1**

Answer: A) 24

Question 37

D cao (18 km); speed = distance / time; change minutes to hours **B1**

Answer: D) 18 km

Question 38

C cao (7 days); total work stays the same: workers x days **B1**

Answer: C) 7 days

Question 39

E cao (12.5 cm); change km to cm, then divide by the scale **B1**

Answer: E) 12.5 cm

Question 40

B cao (90); one part = 10 **B1**

Answer: B) 90

Question 41

B cao (80); 224 ÷ 14 = 16 per part **B1**

Answer: B) 80

Question 42

C cao (2 h 15 min); speed = distance / time; change minutes to hours **B1**

Answer: C) 2 h 15 min

Question 43

A cao (300 g for £1.59); compare the price per unit for each size **B1**

Answer: A) 300 g for £1.59

Question 44

D cao (15 g); find the amount for one person, then multiply **B1**

Answer: D) 15 g

Question 45

A cao (9); one part = 3 **B1**

Answer: A) 9

Question 46

B cao (£20); 90 ÷ 9 = 10 per part **B1**

Answer: B) £20

Question 47

E cao (24 km/h); speed = distance / time; change minutes to hours **B1**

Answer: E) 24 km/h

Question 48

D cao (600 g for £2.22); compare the price per unit for each size **B1**

Answer: D) 600 g for £2.22

Question 49

C cao (500 g); find the amount for one person, then multiply **B1**

Answer: C) 500 g

Question 50

A cao (0.9 km); multiply by the scale, then change cm to km **B1**

Answer: A) 0.9 km

Question 51

D cao (20); one part = 5 **B1**

Answer: D) 20

Question 52

C cao (£45); 105 ÷ 7 = 15 per part **B1**

Answer: C) £45

Question 53

B cao (30 km); speed = distance / time; change minutes to hours **B1**

Answer: B) 30 km

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Question 54

E cao (500 ml for £2.70); compare the price per unit for each size **B1**

Answer: E) 500 ml for £2.70

Question 55

B cao (4 days); total work stays the same: workers x days **B1**

Answer: B) 4 days

Question 56

D cao (5.4 km); multiply by the scale, then change cm to km **B1**

Answer: D) 5.4 km

Question 57

A cao (98); one part = 14 **B1**

Answer: A) 98

Question 58

C cao (49); 168 ÷ 24 = 7 per part **B1**

Answer: C) 49

Question 59

E cao (18 km); speed = distance / time; change minutes to hours **B1**

Answer: E) 18 km

Question 60

B cao (1350 g); find the amount for one person, then multiply **B1**

Answer: B) 1350 g

Question 61

D cao (2.7 km); multiply by the scale, then change cm to km **B1**

Answer: D) 2.7 km

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