3.11 Proportional Reasoning Problem Set: 1-hour Pack

Calculators not allowed · about 60 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 A shop sells tickets at a constant price each. 20 tickets cost £64.20. How many tickets can be bought for £577.80?

(3)

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2 A trader buys an item for £25 and sells it for £15. Work out the percentage loss.

(3)

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3 One of a type of bottles of water costs £5.68. Work out the cost of 2 of them.

(1)

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4 In a survey, 40% of the people were vegetarians. There were 24 vegetarians. How many people were in the survey?

(3)

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5 A trader buys an item for £25 and sells it for £30. Work out the percentage profit.

(3)

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6 One of a type of notebook costs £2.94. Work out the cost of 3 of them.

(1)

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7 In a survey, 45% of the people were cyclists. There were 18 cyclists. How many people were in the survey?

(3)

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8 The table shows pairs of values of two quantities that are directly proportional.

x	**9**	**18**
y	27	?

Work out the missing value.

(2)

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9 The table shows pairs of values of two quantities that are directly proportional.

x	6	8
y	54	?

Work out the missing value.

(2)

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10 A group of 6 people can paint a fence in 15 hours. Each person paints at the same rate. How many people are needed to paint it in 9 hours?

(3)

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11 One of a type of bottles of water costs £3.20. Work out the cost of 4 of them.

(1)

---

12 The table shows pairs of values of two quantities that are directly proportional.

x	5	12
y	20	?

Work out the missing value.

(2)

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13 A school orders 84 identical pens. They are packed in boxes that each hold pens in the ratio of red:blue:green = 3:2:1. How many pens of each colour are in the whole order?

(3)

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14 The table shows pairs of values of two quantities that are directly proportional.

x	5	20
y	40	?

Work out the missing value.

(2)

---

15 In a survey, 35% of the people were girls. There were 70 girls. How many people were in the survey?

(3)

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16 A trader buys an item for £40 and sells it for £56. Work out the percentage profit.

(3)

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17 A shop sells cereal in two sizes. Pack A is 500 g for £0.70. Pack B is 1000 g for £4.62. Which pack is better value? You must show your working.

(3)

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18 A bakery mixes flour and water in the ratio 11:5. It needs at least 48 kg of mixture. Work out the least whole number of kilograms of flour required.

(4)

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19 Write 3/4 as a percentage.

(1)

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Mark scheme · 3.11 Proportional Reasoning Problem Set: 1-hour Pack

Question 1

£64.20 ÷ 20 = £3.21	M1
£577.80 ÷ £3.21	M1
180 cao	A1

Answer: **180**

Question 2

loss of £10 found	M1
£10 ÷ £25 x 100	M1
40% loss cao	A1

Answer: **40% loss**

Question 3

£11.36 cao	B1

Answer: **£11.36**

Question 4

40% = 24 so 1% = 0.6	M1
0.6 x 100	M1
60 cao	A1

Answer: **60**

Question 5

profit of £5 found	M1
£5 ÷ £25 x 100	M1
20% profit cao	A1

Answer: **20% profit**

Question 6

£8.82 cao	B1

Answer: **£8.82**

Question 7

45% = 18 so 1% = 0.4	M1
0.4 x 100	M1
40 cao	A1

Answer: **40**

Question 8

27 ÷ 9 = 3	M1
54 cao	A1

Answer: **54**

Question 9

54 ÷ 6 = 9	M1
72 cao	A1

Answer: **72**

Question 10

6 x 15 = 90	M1
90 ÷ 9	M1
10 cao	A1

Answer: **10 people**

Question 11

£12.80 cao	B1

Answer: **£12.80**

Question 12

20 ÷ 5 = 4	M1
48 cao	A1

Answer: **48**

Question 13

Find total parts 3+2+1 = 6 and divide 84 by 6 to get one part = 14	M1
Multiply 14 by each part for method: red 42, blue 28, green 14	M1
Correct counts: 42 red, 28 blue, 14 green cao	A1

Answer: **42 red, 28 blue, 14 green**

Question 14

40 ÷ 5 = 8	M1
160 cao	A1

Answer: **160**

Question 15

35% = 70 so 1% = 2	M1
2 x 100	M1
200 cao	A1

Answer: **200**

Question 16

profit of £16 found	M1
£16 ÷ £40 x 100	M1
40% profit cao	A1

Answer: **40% profit**

Question 17

price per gram or grams per penny for one pack	M1
same measure for the other pack (or both scaled to a common weight)	M1
Pack A, with a correct comparison	A1

Answer: **Pack A**

Question 18

flour:water = 11:5 so water = 5/11 of flour; total = flour + 5/11 flour = 16/11 flour, and 16/11 flour ≥ 48	M1
so flour ≥ 48*11/16 = 33	M1
check flour = 33 gives total 48 kg exactly, meeting the requirement; flour = 32 gives total 46.545 kg, which fails	M1
33 kg cao	A1

Answer: **33 kg**

Question 19

75% cao	B1

Answer: **75%**

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