3.6 Proportion: 30-minute Pack

EDEXCEL 1MA1 · Calculator allowed · about 30 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 A factory uses 9 metres of fabric to make 6 shirts. Work out the length of fabric needed for 1 shirt.

(Total for Question 1 is 1 mark)

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2 y is directly proportional to x. Given y = 15 when x = 3, find y when x = 7.

(Total for Question 2 is 2 marks)

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3 12 workers take 8 days to pack an order. All the workers work at the same rate.
How many days would it take 24 workers to do the same job?

(Total for Question 3 is 3 marks)

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4 Here are the ingredients for 4 people.
Tomatoes 350 g, onions 20 g.
Work out how much of each ingredient is needed to make the same curry for 18 people.

(Total for Question 4 is 3 marks)

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5 250 g of coffee beans cost £2.50. How many grams can be bought with £45? Give your answer in grams and in kilograms.

(Total for Question 5 is 3 marks)

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6 Show that a smoothie recipe for 4 people using 360 ml milk and 120 g banana would need 990 ml milk and 330 g banana to serve 11 people.

(Total for Question 6 is 4 marks)

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7 A cafe makes milkshakes. Each shake uses 200 ml milk, 50 g sugar and 100 g fruit. Costs are: milk £0.65 per litre, sugar £0.80 per kg, fruit £2.40 per kg.

(a) Calculate the cost of ingredients for one shake, giving your answer to the nearest penny. **(3)**

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(b) The cafe sells each shake for £2.20. Calculate the profit made from selling 5 shakes. Give your answer to the nearest penny. **(3)**

.....

(Total for Question 7 is 6 marks)

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8 A recipe for a sauce uses ingredients in the ratio tomato:oil:vinegar = 6:1:0.5 by mass. Ava wants to make 1.2 kg of the sauce. Calculate the mass of oil she should use, giving your answer in grams.

(Total for Question 8 is 2 marks)

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Mark scheme · 3.6 Proportion: 30-minute Pack

Question 1

1.5 metres cao	**B1**

Answer: 1.5 m (9 m / 6 = 1.5 m).

Question 2

find constant of proportionality k = y/x = 15/3 = 5	**M1**
35 cao	**A1**

Answer: 35 (k = 15/3 = 5, so y = 5 x 7 = 35).

Question 3

12 x 8 = 96 worker-days	**M1**
96 / 24	**M1**
4 days	**A1**

Answer: 4 days

Question 4

multiplier 18/4 or amounts for one person	**M1**
tomatoes 1575 g	**A1**
onions 90 g	**A1**

Answer: tomatoes 1575 g and onions 90 g

Question 5

find grams per £1: 250/2.50 = 100 g per £1 oe	**M1**
multiply by 45 to get grams: 100 x 45 oe	**M1**
4500 g = 4.5 kg cao	**A1**

Answer: 4500 g = 4.5 kg (250 g for £2.50 gives 100 g per £1; 100 x 45 = 4500 g).

Question 6

divide milk by 4 to get 90 ml per person cso	**M1**
divide banana by 4 to get 30 g per person cso	**M1**
multiply 90 ml and 30 g by 11 to show the amounts cso	**M1**
990 ml and 330 g cao cso	**A1**

Answer: 990 ml milk and 330 g banana (360/4 = 90 ml; 120/4 = 30 g; 90 x 11 = 990 ml; 30 x 11 = 330 g).

Question 7

(a) convert milk to litres and find cost: 0.2 L x 0.65 oe	**M1**
(a) convert sugar and fruit to kg and find individual costs: 0.05 kg x 0.80 and 0.1 kg x 2.40 oe	**M1**
(a) £0.41 cao	**A1**

(a) Answer: £0.41 (milk: 0.2 x 0.65 = 0.13; sugar: 0.05 x 0.80 = 0.04; fruit: 0.1 x 2.40 = 0.24; total = 0.41).

(b) find profit per shake: 2.20 - 0.41 oe	**M1**
(b) multiply profit per shake by 5 oe	**M1**
(b) £8.95 cao	**A1**

(b) Answer: £8.95 (profit per shake = 2.20 - 0.41 = 1.79; profit for 5 shakes = 1.79 x 5 = £8.95).

Question 8

find fraction for oil: total parts = 6 + 1 + 0.5 = 7.5, so oil = 1/7.5 of total or equivalent	**M1**
160 g cao	**A1**

Answer: 160 g. Working: total = 1.2 kg = 1200 g; oil = 1/7.5 * 1200 g = 160 g. Check: 1200/7.5 = 160.

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