3.12 Best Buy Questions: 30-minute Pack

EDEXCEL 1MA1 · Calculator allowed · about 30 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 A pack of 6 toilet rolls costs £2.40. A pack of 12 costs £4.56. Which pack is better value per roll? Show your working.

(Total for Question 1 is 2 marks)

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2 Which is cheaper per litre: a 750 ml bottle for £1.20 or a 1.5 litre bottle for £2.50? Give the cheaper option and the price per litre.

(Total for Question 2 is 1 mark)

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3 A pack of 8 pens costs 3.20. A different shop sells individual pens at 0.45 each.
Which is cheaper and by how much per pen? Show working.

(Total for Question 3 is 3 marks)

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4 A shop sells fruit squash in three sizes. Compare the prices and state which is best value per 100 ml.
Small: 500 ml for £1.35. Medium: 1 litre for £2.40. Large: 2 litre for £4.20. Work out the price per 100 ml for each size and give the best value.

(Total for Question 4 is 3 marks)

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5 Oliwia is choosing between two shops for a jacket that has a full price of £60 at both shops.
Northgate Fashion: 10% off, then a further 10% off the reduced price at the till.
Willowbrook Clothing: a single discount of 20% off.
Work out the final price at each shop and state which shop is cheaper, and by how much.

(Total for Question 5 is 5 marks)

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6 A gardener needs at least 9 kg of compost for a raised bed. Compost is sold in 2 kg bags at £3.20 and 5 kg bags at £7.00.
Show that buying one 5 kg bag and two 2 kg bags is cheaper than buying five 2 kg bags or two 5 kg bags.

(Total for Question 6 is 3 marks)

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7 A retailer offers a yearly subscription with the following two payment options:
Option 1: Pay monthly at m pounds per month for 12 months with no discount.
Option 2: Pay a single yearly price of 10m - £24. For which values of m is Option 2 cheaper than Option 1? Show your algebra and give your answer in inequality form.

(Total for Question 7 is 5 marks)

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8 Yusuf is comparing two boxes of cereal in a supermarket in Bristol.
Box X: 750 g for £2.85.
Box Y: 500 g for £1.95.
Yusuf's working is shown below.
Box X: 2.85 / 700 * 100 = 40.71p per 100 g (to 2 dp)
Box Y: 1.95 / 500 * 100 = 39p per 100 g
Since 39 is less than 40.71, Yusuf concludes that Box Y is better value.
Identify the mistake in Yusuf's working, then work out the correct price per 100 g for Box X and state which box actually gives better value.

(Total for Question 8 is 5 marks)

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Mark scheme · 3.12 Best Buy Questions: 30-minute Pack

Question 1

Calculate unit prices: 240p/6 = 40p; 456p/12 = 38p	**M1**
12 pack is better value, 38p per roll cao	**A1**

Answer: 12 pack is better value: 38p per roll (6 pack is 40p per roll).

Question 2

750 ml bottle cheaper, 120p/0.75 = 160p per litre cao	**B1**

Answer: 750 ml bottle, 160p per litre (cheaper than 166.67p per litre for 1.5 L).

Question 3

find unit price of pack: 3.20/8 = 0.40 shown	**M1**
compare with 0.45 and find difference 0.05 shown	**M1**
Pack is cheaper by 5p per pen cao	**A1**

Answer: Pack is cheaper by 0.05 (5p) per pen

Question 4

Calculate two unit prices, e.g. small 135p/500*100 = 27p, medium 240p/1000*100 = 24p	**M1**
Calculate large: 420p/2000*100 = 21p	**M1**
Large bottle is best value, 21p per 100 ml cao	**A1**

Answer: Small = 27p per 100 ml, Medium = 24p per 100 ml, Large = 21p per 100 ml. Best value = Large, 21p per 100 ml.

Question 5

apply the first discount at Northgate Fashion: 60 * 0.9, or a complete method 60 * 0.9 * 0.9	**M1**
Northgate Fashion final price = £48.60 cao	**A1**
apply the single discount at Willowbrook Clothing: 60 * 0.8	**M1**
Willowbrook Clothing final price = £48.00 cao	**A1**
state Willowbrook Clothing is cheaper, by £0.60, cao (ft from the two totals)	**B1**

Answer: Northgate Fashion: 60 * 0.9 * 0.9 = £48.60. Willowbrook Clothing: 60 * 0.8 = £48.00. Willowbrook Clothing is cheaper, by £0.60. (Two successive 10% discounts give an overall reduction of 19%, not 20%: 1 - 0.9*0.9 = 0.19.) Working check: 48.60 - 48.00 = 0.60.

Question 6

Calculate cost of 5 x 2 kg = 5 * £3.20 = £16.00 cso	**dM1**
Calculate cost of 1 x 5 kg + 2 x 2 kg = £7.00 + £6.40 = £13.40 cso	**dM1**
Conclude cheapest is 5 kg + 2x2 kg = £13.40 cao, less than both £16.00 and £14.00	**A1**

Answer: 1 x 5 kg + 2 x 2 kg costs £13.40 and gives 9 kg. Five 2 kg bags cost £16.00 (10 kg). Two 5 kg bags cost £14.00 (10 kg). Since £13.40 is less than both £16.00 and £14.00, one 5 kg bag plus two 2 kg bags is the cheapest way to get at least 9 kg.

Question 7

form inequality 10m - 24 < 12m or equivalent	**M1**
rearrange: -24 < 2m leading to m > -12 or equivalent sign handling	**M1**
simplify correctly to m > -12	**A1**
interpretation: since m is price (m > 0), Option 2 is always cheaper for all realistic m > 0 (give reasoning)	**B1**
final statement in inequality form m > -12 with note that for all practical m > 0 Option 2 is cheaper	**A1**

Answer: Inequality: 10m - 24 < 12m -> -24 < 2m -> m > -12. Since m represents a positive monthly price, Option 2 is cheaper for all realistic m > 0. Working check: substitute m = 10 gives yearly price 10*10-24=76 < 120.

Question 8

identify that Yusuf used 700 g instead of the correct mass of 750 g for Box X	**B1**
recalculate Box X using the correct mass: 2.85 / 750 * 100	**M1**
Box X = 38p per 100 g cao	**A1**
Box Y correctly confirmed as 39p per 100 g	**B1**
correct conclusion: Box X is actually the better value (cheaper per 100 g), not Box Y as Yusuf claimed, cao	**A1**

Answer: Yusuf used 700 g instead of 750 g for Box X. Correct calculation: Box X = 2.85 / 750 * 100 = 38p per 100 g. Box Y = 1.95 / 500 * 100 = 39p per 100 g. Box X is actually the better value, not Box Y as Yusuf concluded. Working check: 2.85 / 750 = 0.0038, * 100 = £0.38 = 38p; 1.95 / 500 = 0.0039, * 100 = £0.39 = 39p; 38 is less than 39.

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