3.8 Percentage Change: 30-minute Pack

EDEXCEL 1MA1 · Calculator allowed · about 30 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 A quantity decreases from 90 to 72. Work out the percentage decrease.

(Total for Question 1 is 2 marks)

2 A quantity increases from 50 to 63. Work out the percentage increase.

(Total for Question 2 is 2 marks)

3 A quantity decreases from 120 to 84. Work out the percentage decrease.

(Total for Question 3 is 2 marks)

4 Increase 150 by 20%.

(Total for Question 4 is 2 marks)

5 Decrease 80 by 15%.

(Total for Question 5 is 2 marks)

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6 Olamide buys a car for £9200. She sells it for £7820. Work out Olamide's percentage loss.

(Total for Question 6 is 3 marks)

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7 Yara buys a 5 kg bag of rice for £8. She repackages it into 250 g bags and sells each bag for 65p. Work out Yara's percentage profit.

(Total for Question 7 is 4 marks)

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8 The price of a commodity first increases by p% then decreases by q% and ends up at the same price as it started.
Show that to first order (neglecting the small product term pq/100), q approximately equals p.
You must show the algebraic steps leading to the approximation.

(Total for Question 8 is 7 marks)

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Mark scheme · 3.8 Percentage Change: 30-minute Pack

A correct answer earns full marks unless the question asks for working, a method, proof or explanation.

Question 1

18 seen (90 - 72), or equivalent method	**M1**
20% cao	**A1**

Answer: 20%

Question 2

13 seen (63 - 50), or equivalent method	**M1**
26% cao	**A1**

Answer: 26%

Question 3

36 seen (120 - 84), or equivalent method	**M1**
30% cao	**A1**

Answer: 30%

Question 4

multiply 150 by 1.20 or show correct method to find 20% and add to 150	**M1**
180 cao	**A1**

Answer: 180

Question 5

find 15% of 80 or multiply 80 by 0.85	**M1**
68 cao	**A1**

Answer: 68

Question 6

1380 seen (9200 - 7820)	**M1**
1380/9200 x 100 (oe)	**M1**
15% cao	**A1**

Answer: 15%

Question 7

5000/250 = 20 bags	**M1**
20 x 0.65 = 13 (total revenue)	**M1**
13 - 8 = 5 (profit), dependent on both M1s	**dM1**
62.5% cao	**A1**

Answer: 62.5%

Question 8

state final price = initial x (1 + p/100) x (1 - q/100)	**M1**
set (1 + p/100)(1 - q/100) = 1 since final = initial	**M1**
expand: 1 + p/100 - q/100 - (pq)/10000 = 1	**M1**
cancel 1 and rearrange to p/100 - q/100 - (pq)/10000 = 0	**M1**
rearrange to q/100 = p/100 - (pq)/10000	**M1**
neglect (pq)/10000 as small to get q/100 approx= p/100	**M1**
conclude q approx= p with brief justification cao	**A1**

Answer: q approx= p

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