HIGHER

6.4 Repeated Percentage Change: 1-hour Pack

EDEXCEL 1MA1 · Calculator allowed · about 60 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Write down the single decimal multiplier for a percentage decrease of 22%.

(Total for Question 1 is 1 mark)

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2 Amara invests £1500 in a savings account that pays 3% per annum compound interest. She leaves the money in the account for 2 years and makes no withdrawals.

Work out the value of Amara's investment at the end of the 2 years. Give your answer to the nearest penny.

(Total for Question 2 is 3 marks)

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3 A delivery company buys a new van for £18000.
The van depreciates by 20% in its first year and then by 15% in its second year.

(a) Work out the value of the van after 2 years. **(3)**

.....

(b) Work out the total depreciation over the 2 years as a percentage of the original £18000. **(2)**

.....

(Total for Question 3 is 5 marks)

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4 A population of bacteria increases by 20% every hour. The starting population is 500. Find the population after 3 hours.

(Total for Question 4 is 2 marks)

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5 The price of a laptop is £750 now. Due to inflation, the price increases by 2% each year.

Work out the price of the laptop in 4 years' time. Give your answer to the nearest penny.

(Total for Question 5 is 3 marks)

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6 A jacket in a shop costs £80.
In a spring sale, the price is reduced by 25%.
After the sale, the price is then increased by 20%.
The jacket is then reduced by a further 10% in a winter sale.

(a) Work out the price of the jacket after all three changes. **(3)**

.....

(b) Work out the overall percentage change in the price of the jacket compared with the original £80. State whether this is an increase or a decrease. **(2)**

.....

(Total for Question 6 is 5 marks)

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7 A car is valued at £9000. Its value depreciates by 15% each year. An insurance company writes off the car once its value falls below £4000.

Determine, with working, whether the car has been written off after 5 years.

(Total for Question 7 is 4 marks)

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8 A loan of £18950 is charged 4% compound interest per year. Work out the total amount owed after 3 years. Give your answer to the nearest penny.

(Total for Question 8 is 3 marks)

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9 £4900 is invested. Compound interest is paid at 3% in the first year and 5% in the second year. Work out the value of the investment at the end of year 2. Give your answer to the nearest penny.

(Total for Question 9 is 3 marks)

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10 A machine is bought for £2500. Its value decreases by 5% each year. Work out its value after 2 years. Give your answer to the nearest penny.

(Total for Question 10 is 3 marks)

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11 £4000 is invested at 10% compound interest per year. After how many whole years will the investment first be worth more than £8000? You must show your working.

(Total for Question 11 is 4 marks)

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12 A loan of £6800 is charged 3% compound interest per year. Work out the total amount owed after 2 years. Give your answer to the nearest penny.

(Total for Question 12 is 3 marks)

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13 A car is bought for £18,500. It depreciates by 15% in the first year, and then by 10% in each subsequent year. Calculate its value after 3 years, giving your answer to the nearest pound.

(Total for Question 13 is 3 marks)

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14 The value of a rare coin increases by 7% each year. After 2 years its value is £2,289.80. Find its original value.

(Total for Question 14 is 3 marks)

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Mark scheme · 6.4 Repeated Percentage Change: 1-hour Pack

Question 1

0.78 oe	**B1**

Answer: 0.78

Question 2

1500 x 1.03 (= 1545) or 1500 x 1.03^2 set up	**M1**
1545 x 1.03 (oe, dep on first M1)	**M1**
1591.35 cao	**A1**

Answer: £1591.35

Question 3

(a) 18000 x 0.8 (= 14400)	**M1**
(a) 14400 x 0.85 (oe, or 18000 x 0.8 x 0.85)	**M1**
(a) 12240 cao	**A1**

(a) Answer: £12240

(b) (18000 - 12240) / 18000 x 100 (oe), ft their (a)	**M1**
(b) 32% cao	**A1**

(b) Answer: 32%

Question 4

500 * 1.2^3 oe	**M1**
864 cao	**A1**

Answer: 864

Question 5

1.02^4 (= 1.08243216) oe	**M1**
750 x their 1.08243216	**M1**
£811.82 (awrt) cao	**A1**

Answer: £811.82

Question 6

(a) 80 x 0.75 (= 60)	**M1**
(a) 60 x 1.2 (= 72), then x 0.9 (or full chain 80 x 0.75 x 1.2 x 0.9)	**M1**
(a) £64.80 cao	**A1**

(a) Answer: £64.80

(b) (80 - their (a)) / 80 x 100 (oe, ft)	**M1**
(b) 19% decrease cao (both value and direction required)	**A1**

(b) Answer: 19% decrease

Question 7

0.85^5 (= 0.4437053125) oe	**M1**
9000 x their 0.4437053125	**M1**
£3993.35 (awrt) cao	**A1**
Yes, written off, since £3993.35 < £4000 (dep on correct value, ft)	**A1**

Answer: Yes, the car has been written off (worth £3993.35, which is below £4000)

Question 8

multiplier 1.04 identified	**M1**
18950 x 1.04^3 oe	**M1**
£21316.17 cao	**A1**

Answer: £21316.17

Question 9

a correct multiplier used for one year	**M1**
4900 x 1.03 x 1.05	**M1**
£5299.35 cao	**A1**

Answer: £5299.35

Question 10

multiplier 0.95 identified	**M1**
2500 x 0.95^2 oe	**M1**
£2256.25 cao	**A1**

Answer: £2256.25

Question 11

multiplier 1.1	**M1**
tests values for successive years	**M1**
value after 7 years £7794.87 (not enough)	**A1**
8 years cao	**A1**

Answer: 8 years

Question 12

multiplier 1.03 identified	**M1**
6800 x 1.03^2 oe	**M1**
£7214.12 cao	**A1**

Answer: £7214.12

Question 13

correct multipliers identified: 0.85 for year 1, 0.90 for years 2 and 3	**M1**
18500 * 0.85 * 0.9 * 0.9 (or 18500 * 0.85 * 0.9^2) oe	**M1**
awrt £12,737	**A1**

Answer: £12,737

Question 14

1.07^2 (= 1.1449) identified as the 2-year multiplier	**M1**
2289.80 / 1.1449 oe	**M1**
£2,000 cao	**A1**

Answer: £2,000

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