3.7 Percentage Change and Multipliers: Test Pack

Calculators not allowed · about 55 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Write down 10% of 360.

(1)

2 A phone price is increased by 15% and then decreased by 10%. If the original price was £200, find the final price. Explain briefly why this final price is not the same as increasing by 5% overall.

(3)

3 A town's population falls by 6% each year. The current population is 24 000. Work out the population after 3 years, giving your answer to the nearest whole number.

(3)

4 Express an increase of 40% as a multiplier and as a fractional multiplier.

(2)

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5 Explain why increasing a number by 20% and then by 30% is not the same as increasing it by 50%. Give a short numerical example to support your explanation.

(2)

6 A small shop had sales of £12,500 last year. Sales rose by 3% in the first year and by 4% in the second year. Work out the sales after the two years, correct to the nearest pound.

(3)

7 A jacket costs £60. In a sale there is 25% off. Work out the sale price.

(2)

8 The price of a TV is £120 before VAT. VAT is charged at 10%. Work out the price including VAT.

(2)

9 After a 12% increase, the price of a laptop is £112. Work out the original price.

(3)

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10 (a) Write down the multiplier for a 15% decrease.
(b) Use your multiplier to decrease 50 by 15%.

(2)

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11 A car is worth £500. Its value is decreased by 25% in the first year and then decreased by 5% of its new value in the second year. Work out its value at the end of the second year.

(3)

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12 A bike costs £90. A shop offers 5% off. A second shop sells the same bike for £90.50. Which shop is cheaper, and by how much?

(3)

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13 A ticket costs £50. The price rises by 8%. Work out the new price.

(2)

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14 A car is worth £500. Its value is increased by 20% in the first year and then increased by 5% of its new value in the second year. Work out its value at the end of the second year.

(3)

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15 A laptop priced at £560 is reduced by 35% in a sale. Work out the sale price.

(2)

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16 A shop increases the price of a jacket by 40% and then reduces the new price by 25% in a flash sale. The original price was £70. Work out the final price, and state the overall percentage change from the original price.

(3)

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17 Find 15% of 80.

(1)

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18 Increase 220 by 35%. Give your answer as a whole number.

(2)

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19 Decrease 340 by 15%.

(2)

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Mark scheme · 3.7 Percentage Change and Multipliers: Test Pack

Question 1

36 cao	B1

Answer: **36**

Question 2

use of multipliers 1.15 and 0.9 or calculation steps shown leading to 200 x 1.15 x 0.9	M1
correct final price calculation 200 x 1.035 = 207 or equivalent	M1
£207 and explanation that successive percentage changes multiply not add, so 1.15 x 0.9 = 1.035 not 1.05	A1

Answer: **£207**

Question 3

use of multiplier 0.94 three times or combined multiplier 0.94^3	M1
correct intermediate calculation e.g. 24000 x 0.94 = 22560 then further steps	M1
19934 (population) cao	A1

Answer: **19934**

Question 4

recognition that 100% + 40% = 140% giving 1.4	M1
1.4 and 7/5 cao	A1

Answer: **1.4 and 7/5**

Question 5

correct statement that multipliers multiply not add (1.2 x 1.3 = 1.56 not 1.5)	M1
example such as starting with 100 gives 100 x1.2 x1.3 = 156 not 150 cao	A1

Answer: **Because multipliers multiply: 1.2 x 1.3 = 1.56, so 100 -> 156 not 150**

Question 6

use of multipliers 1.03 then 1.04 or combined 1.03 x 1.04	M1
intermediate calculation 12500 x 1.03 = 12875 or similar	M1
£13390 cao	A1

Answer: **13390**

Question 7

25% of 60 = 15 found or multiplier 0.75	M1
£45 cao	A1

Answer: **£45**

Question 8

10% of 120 = 12 found or multiplier 1.1	M1
£132 cao	A1

Answer: **£132**

Question 9

multiplier 1.12 (or 112% = £112)	M1
£112 ÷ 1.12	M1
£100 cao	A1

Answer: **£100**

Question 10

(a) 0.85	B1
(b) 42.5	B1

Answer: **(a) 0.85, (b) 42.5**

Question 11

first change: £375 (or multiplier 0.75)	M1
second change applied to the new value	M1
£356.25 cao	A1

Answer: **£356.25**

Question 12

first shop price £85.50 found	M1
compares £85.50 with £90.50	M1
The first shop is cheaper by £5 cao	A1

Answer: **The first shop is cheaper by £5**

Question 13

8% of 50 = 4 or a multiplier of 1.08 used	M1
£54 cao	A1

Answer: **£54**

Question 14

first change: £600 (or multiplier 1.2)	M1
second change applied to the new value	M1
£630 cao	A1

Answer: **£630**

Question 15

use of multiplier 560 x 0.65	M1
£364 cao	A1

Answer: **£364**

Question 16

apply increase: 70 x 1.4 = 98	M1
apply decrease: 98 x 0.75 = 73.5	M1
£73.50, an overall increase of 5% cao	A1

Answer: **£73.50; a 5% increase overall**

Question 17

12 cao	B1

Answer: **12**

Question 18

use of multiplier 220 x 1.35	M1
297 cao	A1

Answer: **297**

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Question 19

use of multiplier 340 x 0.85	**M1**
289 cao	**A1**

Answer: **289**

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