

## Percentages and Reverse Percentages

A coat costing £48 has its price increased by 15%. What is the new cost?

$$£48 \times 1.15 = £55.20$$

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A coat in a sale is offered for £48 after having 20% taken off. How much was it originally?

$$\text{original} \times 0.8 = £48$$

$$\text{original} = \frac{48}{0.8} = £60$$

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VAT is a tax on sales of 20%

A car costs £23000 including VAT  
What is the price excluding VAT.

$$23000 = 120\% \text{ of original}$$

$$23000 \div 1.2 = £19166.67$$

11. A workforce is reduced by 5% to 437. What was the previous size of the workforce?
12. Including 20% VAT a television costs £420. What is the ex-VAT price?
13. 442 soldiers completed their training course. If 15% dropped out, how many began the course?
14. A coat is priced at £42 in a sale with 25% off. What was the price of the coat before the sale?
15. After a 15% price rise a cycle cost £184. What was the price before the price rise?

10. Decrease £33 by 23%  
 $100\% - 23\% = 77\%$   
Find 77% of £33  
 $£33 \times 0.77 = £25.41$

11. Workforce reduced by 5% to 437  
Original  $\times 0.95 = 437$   
so  $437 \div 0.95 = \text{original}$   
 $437 \div 0.95 = 460$   
Original workforce = 460

12. Ex-VAT price + 20% = £420  
Ex-VAT price  $\times 1.20 = £420$   
so  $£420 \div 1.20 = \text{Ex-VAT Price}$   
 $£420 \div 1.20 = £350$   
Ex-VAT price = £350

13. Original - 15% = 442  
Original  $\times 0.85 = 442$   
so  $442 \div 0.85 = \text{original}$   
 $442 \div 0.85 = 520$   
520 soldiers started course

14. Original - 25% = £42  
Original  $\times 0.75 = £42$   
so  $£42 \div 0.75 = \text{original}$   
 $£42 \div 0.75 = £56$   
Coat was originally £56

15. Original + 15% = £184  
Original  $\times 1.15 = £184$   
so  $£184 \div 1.15 = £160$   
Cycle was originally £160  
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