

PERCENTAGES

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1	Find 10%, 25%, 50% and 75% of a number
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6	Fractions, decimals, percentages. Equivalence and conversion
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12	Reverse percentages
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14	Recap 3

	100%	£40										
$\frac{1}{2}$	50%	20					20					$100\% \div 2$
$\frac{1}{4}$	25%	10	10	10	10	10	10	10	10		$100\% \div 4$	
$\frac{1}{10}$	10%	4	4	4	4	4	4	4	4	4	$100\% \div 10$	

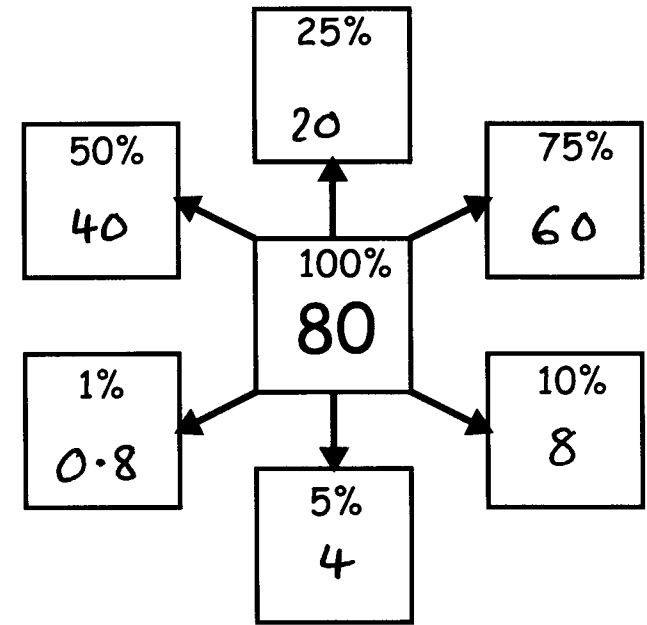
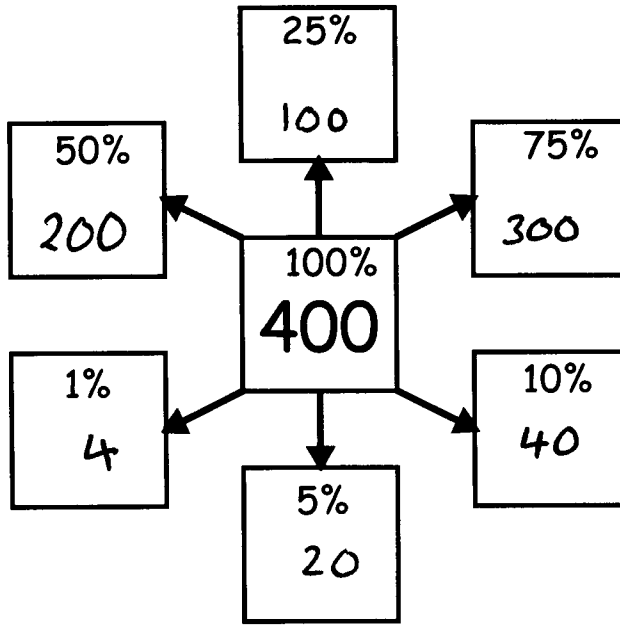
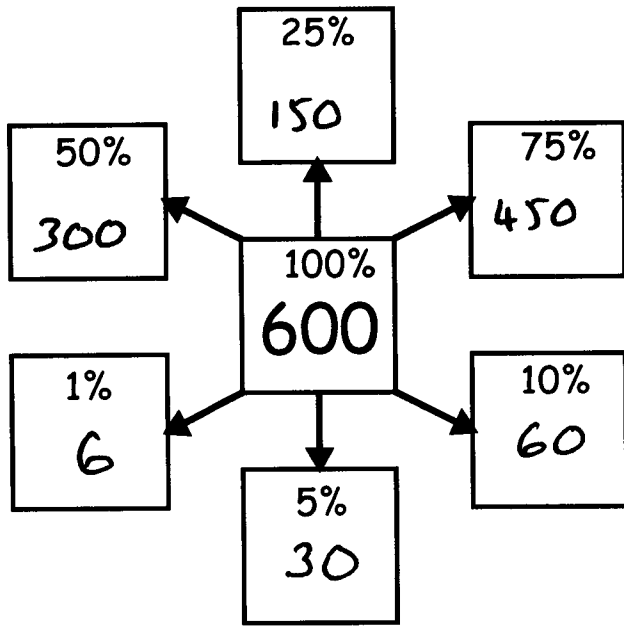
What is
 50% of £40 20
 25% of £40 10
 75% of £40 30
 10% of £40 4
 30% of £40 12
 70% of £40 28

	100%	£20										
$\frac{1}{2}$	50%	10					10					$100\% \div 2$
$\frac{1}{4}$	25%	5	5	5	5	5	5	5	5		$100\% \div 4$	
$\frac{1}{10}$	10%	2	2	2	2	2	2	2	2	2	$100\% \div 10$	

What is
 50% of £20 10
 25% of £20 5
 75% of £20 15
 10% of £20 2
 20% of £20 4
 80% of £20 16

	100%	£60										
$\frac{1}{2}$	50%	30					30					$100\% \div 2$
$\frac{1}{4}$	25%	15	15	15	15	15	15	15	15		$100\% \div 4$	
$\frac{1}{10}$	10%	6	6	6	6	6	6	6	6	6	$100\% \div 10$	

What is
 50% of £60 30
 25% of £60 15
 75% of £60 45
 10% of £60 6
 40% of £60 24
 90% of £60 36



23% of 600 138
 $10\% + 16\% + 1\% + 1\% + 1\% = 23\%$
 $60 + 60 + 6 + 6 + 6 = 138$
 61% of 600 366

11% of 400 44

 52% of 400 208

6% of 80 4.8

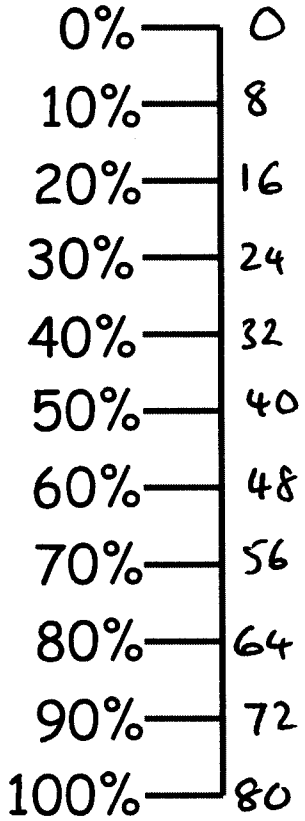
 32% of 80 25.6

8% of 600 . 48

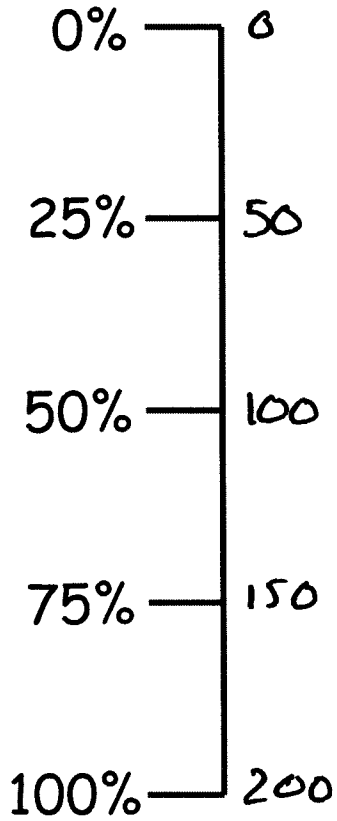
90% of 400 360

74% of 80 59.2

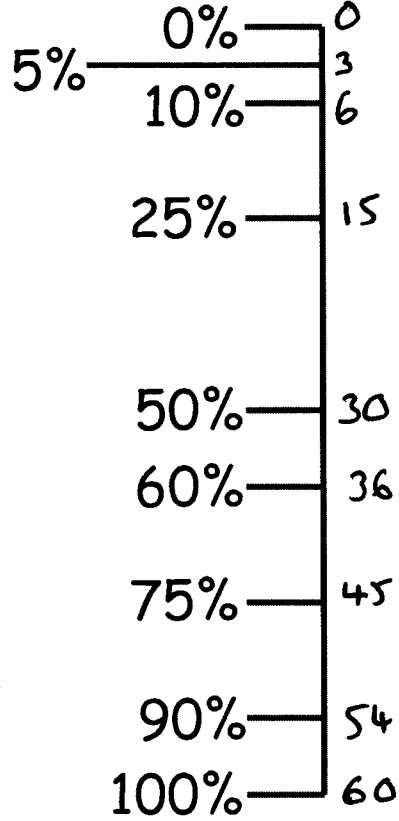
80



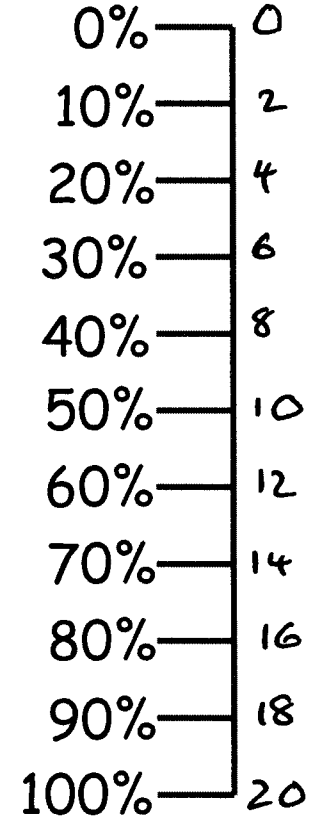
200



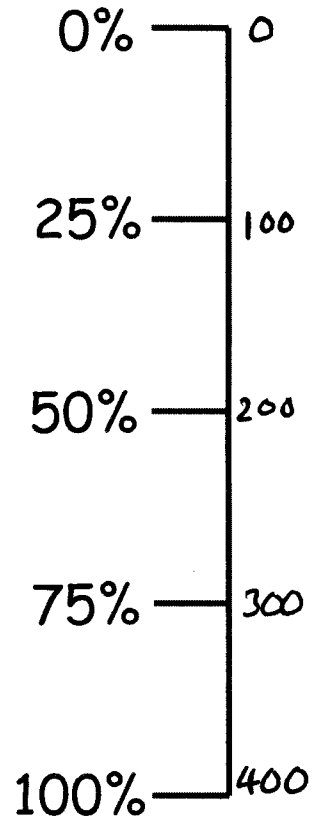
60



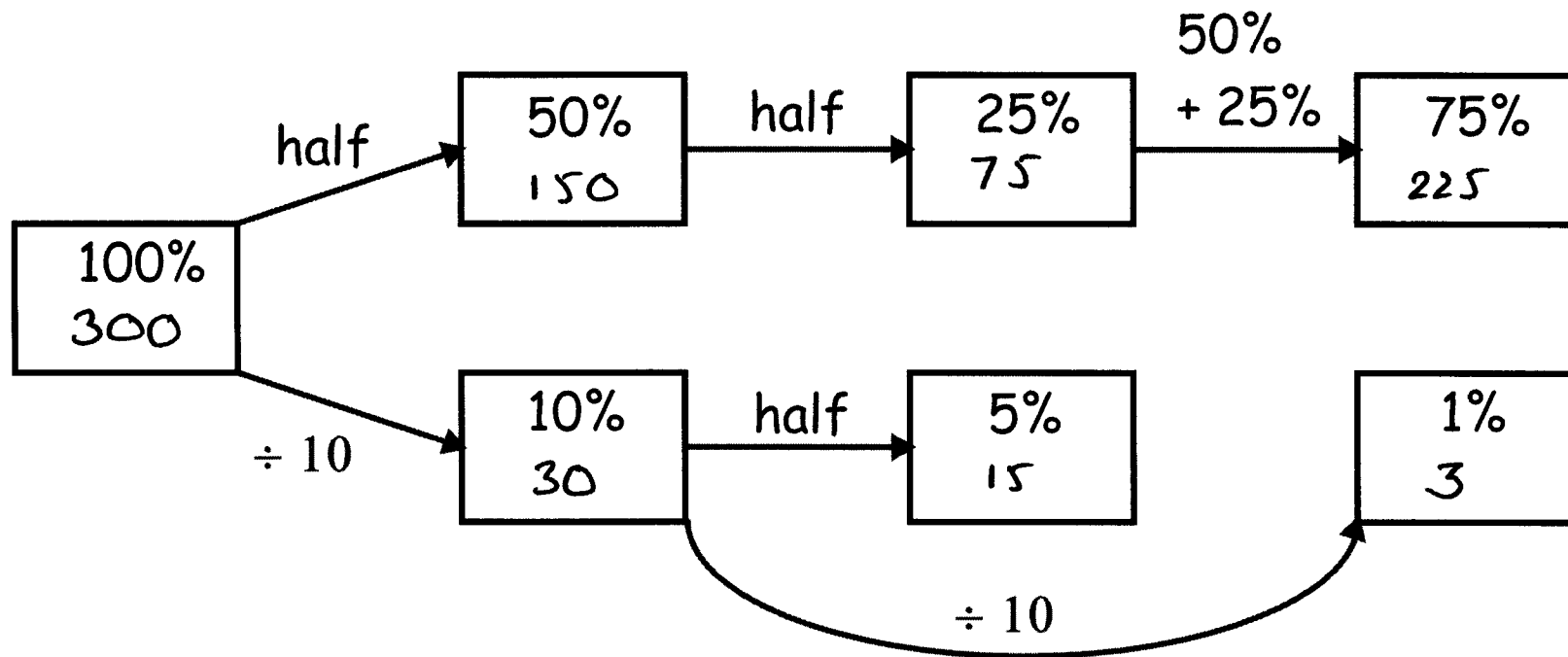
20






400









③



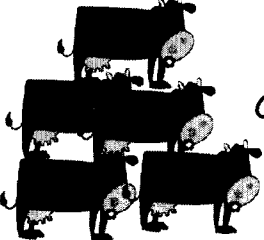


- 1 Find 17% of 300. $10\% + 5\% + 1\% + 1\% = 17\%$ $30 + 15 + 3 + 3 = 51$
 - 2 Find 63% of 300. 189
 - 3 What percentage of 300 is 93? = 31%
 - 4 What percentage of 300 is 201? = 67%
- | | | |
|----|---|-----|
| 75 | = | 25% |
| 15 | = | 5% |
| 3 | = | 1% |
| 93 | | 31% |

	Fraction	Decimal	Percentage
 Bears	$\frac{1}{4}$	0.25	25%
 Ducks	$\frac{1}{4}$	0.25	25%
 Cows	$\frac{2}{4} = \frac{1}{2}$	0.5	25%

	Fraction	Decimal	Percentage
 Bears	$\frac{3}{10}$	0.3	30%
 Ducks	$\frac{5}{10}$	0.5	50%
 Cows	$\frac{2}{10}$	0.2	20%

	Fraction	Decimal	Percentage
 Bears	$\frac{2}{5}$	0.4	40%
 Ducks	$\frac{1}{5}$	0.2	20%
 Cows	$\frac{2}{5}$	0.4	40%

	Fraction	Decimal	Percentage
 Bears	$\frac{2}{8} = \frac{1}{4}$	0.25	25%
 Ducks	$\frac{1}{8}$	0.125	12.5%
 Cows	$\frac{5}{8}$	0.625	62.5%

Fractions, decimals and percentages

Percentage	Decimal	Fraction (cancel if possible)
28%	0.28	$\frac{28}{100} = \frac{7}{25}$

Drawing

x	x	x	x	x
x	x			

Percentage	Decimal	Fraction (cancel if possible)
35%	0.35	$\frac{35}{100} = \frac{7}{20}$

Drawing

x	x	x	x	x
x	x			

Percentage	Decimal	Fraction
62.5%	$5 \div 8 = 0.625$	$\frac{5}{8}$

Drawing

x	x	x	x
x			

Percentage	Decimal	Fraction
45%	$9 \div 20 = 0.45$	$\frac{9}{20}$

Drawing

Percentage	Decimal	Fraction (cancel if possible)
87.5%	$7 \div 8 = 0.875$	$\frac{7}{8}$

Drawing

x	x	x	x
x	x	x	

8 times table	1	2	3	4	5	6	7	8	9	10
	8	16	24	32	40	48	56	64	72	80

Percentage Increase

1 Increase 120 by 14%

$$100\% + 14\% = \begin{array}{c} \text{percentage} \\ 114\% \end{array} = \begin{array}{c} \text{decimal} \\ 1.14 \end{array}$$

In one calculation the answer is $120 \times 1.14 = 136.8$

2 Increase 230 by 26%

$$100\% + 26\% = \begin{array}{c} \text{percentage} \\ 126\% \end{array} = \begin{array}{c} \text{decimal} \\ 1.26 \end{array}$$

In one calculation the answer is $1.26 \times 230 = 289.8$

3 Increase 84 by 56%

$$100\% + 56\% = \begin{array}{c} \text{percentage} \\ 156\% \end{array} = \begin{array}{c} \text{decimal} \\ 1.56 \end{array}$$

In one calculation the answer is $1.56 \times 84 = 131.04$

4 Increase 620 by 8%

$$100\% + 8\% = \begin{array}{c} \text{percentage} \\ 108\% \end{array} = \begin{array}{c} \text{decimal} \\ 1.08 \end{array}$$

In one calculation the answer is $1.08 \times 620 = 669.6$

5 Increase 650 by 68%

$$100\% + 68\% = \begin{array}{c} \text{percentage} \\ 168\% \end{array} = \begin{array}{c} \text{decimal} \\ 1.68 \end{array}$$

In one calculation the answer is $1.68 \times 650 = 1092$

6 Increase 240 by 12%

$$\text{In one calculation the answer is } 1.12 \times 240 = 268.8$$

7 Increase 480 by 6%

$$\text{In one calculation the answer is } 1.06 \times 480 = 508.8$$

8 Increase 90 by 15%

$$\text{In one calculation the answer is } 1.15 \times 90 = 103.5$$

9 Increase 560 by 32%

$$\text{In one calculation the answer is } 1.32 \times 560 = 739.2$$

10 Increase 600 by 48%

$$\text{In one calculation the answer is } 1.48 \times 600 = 888$$

Percentage Decrease

1 Decrease 120 by 14%

$$100\% - 14\% = \begin{array}{c} \text{percentage} \\ 86\% \end{array} = \begin{array}{c} \text{decimal} \\ 0.86 \end{array}$$

In one calculation the answer is $0.86 \times 120 = 103.2$

2 Decrease 230 by 26%

$$100\% - 26\% = \begin{array}{c} \text{percentage} \\ 74\% \end{array} = \begin{array}{c} \text{decimal} \\ 0.74 \end{array}$$

In one calculation the answer is $0.74 \times 230 = 170.2$

3 Decrease 84 by 56%

$$100\% - 56\% = \begin{array}{c} \text{percentage} \\ 44\% \end{array} = \begin{array}{c} \text{decimal} \\ 0.44 \end{array}$$

In one calculation the answer is $0.44 \times 84 = 36.96$

4 Decrease 620 by 8%

$$100\% - 8\% = \begin{array}{c} \text{percentage} \\ 92\% \end{array} = \begin{array}{c} \text{decimal} \\ 0.92 \end{array}$$

In one calculation the answer is $0.92 \times 620 = 570.4$

5 Decrease 650 by 68%

$$100\% - 68\% = \begin{array}{c} \text{percentage} \\ 32\% \end{array} = \begin{array}{c} \text{decimal} \\ 0.32 \end{array}$$

In one calculation the answer is $0.32 \times 650 = 208$

6 Decrease 240 by 12%

$$\text{In one calculation the answer is } 0.88 \times 240 = 211.2$$

7 Decrease 480 by 6%

$$\text{In one calculation the answer is } 0.94 \times 480 = 451.2$$

8 Decrease 90 by 15%

$$\text{In one calculation the answer is } 0.85 \times 90 = 76.5$$

9 Decrease 560 by 32%

$$\text{In one calculation the answer is } 0.68 \times 560 = 380.8$$

10 Decrease 600 by 48%

$$\text{In one calculation the answer is } 0.52 \times 600 = 312$$

Percentages

1) What is 50% of £30? £15

2) What is 25% of £40? £10

3) What is 75% of £20? £15

4) What is 10% of £80? £8

5) Sally took a test and scored 50%. The test was out of 20. How many marks did she get? 10

6) Brian took the test also and scored 25%. The test was out of 20. How many marks did he get? 5

7) Tariq took the test also and scored 75%. The test was out of 20. How many marks did he get? 15

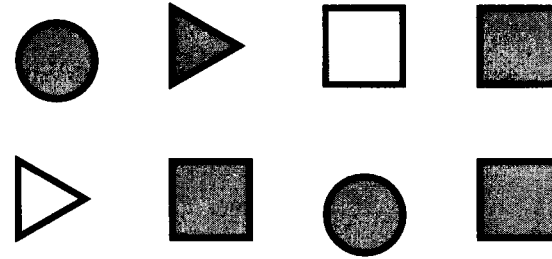
8) The autumn term contains 80 school days. Amy was absent for 10% of the days. How many days was she absent for? 8

9) The price of a coat is £60. In a sale the price is reduced by 25%. What is the sale price of the coat? £45

10) The price of a TV is £200. The price is to go up by 50%. What is the new price? £300

9

What percentage of these shapes are



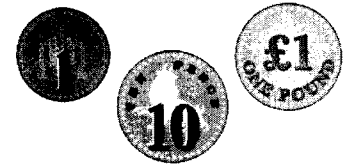
11) Squares? 50% 12) Circles? 25%

13) Shaded? 75% 14) Not shaded? 25%

15) Rectangles? 0%

16) What percentage of the circles are shaded? 100%

Chloe has 12 coins in her purse.



17) 25% of them are 1p coins. How many 1p coins? 3

18) 50% of them are 10p coins. How many 10p coins? 6

19) The rest are £1 coins. How many £1 coins? 3

20) How much money does she have in her purse?

£3.63

16 Numbers 15 clues. Which number is left?

261	327	312	372
380	35	360	36
132	20	578	324
38	45	40	85

15% of 240 = 36

12 out of 60 is what %
20

Decrease 600 by 38%
372

17% of 340 = 57.8

³⁰
~~3%~~ of 1200 = 360

Increase 300 by 9%
327

50% of 170 = 85

Decrease 300 by ^{13%}~~17%~~
261 ~~249~~

Decrease 400 by 5%
380

Increase 260 by 20%
312

Increase 240 by 35%
324

Increase 20 by 90%
38

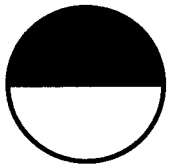
Decrease 165 by 20%
132

36 out of 80 is what %
45

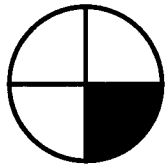
14 out of 40 is what %
35%

40 is left.

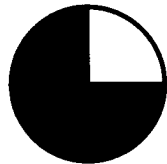
What percentage is shaded?



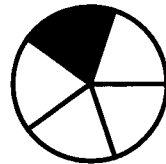
50%



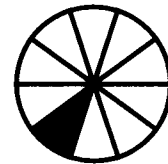
25%



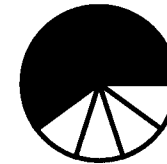
75%



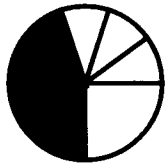
20%



10%



60%



45%



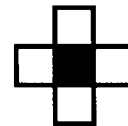
25%



12.5%



10%



20%



5%



0%

⑩

£2000 is invested in a savings account. At the end of each year it earns 5% interest on the end of year total. How much money is in the account at the of 4 years?

End of Year	Balance	5%	New Balance
1	2000	100	2100
2	2100	105	2205
3	2205	110.25	2315.25
4	2315.25	115.76	2431.01

Quicker Method
$2000 \times 1.05^4 = 2431.01$

A car costs £15000 new. Each year it loses 15% of its value. What is the car worth at the end of 5 years?

End of Year	Balance	15%	New Balance
1	15000	2250	12750
2	12750		
3			
4			
5			

Quicker Method
$15000 \times 0.85^5 = £6655.60$

The next two are the same as the first two
 £2000 is invested in a savings account. At the end of each year it earns 5% interest on the

End of Year	Balance	5%	New Balance
1	2000	100	2100
2	2100		
3			
4			

Quicker Method
$2000 \times 1.05^4 = 2431.01$

A car costs £15000 new. Each year it loses 15% of its value. What is the car worth at the

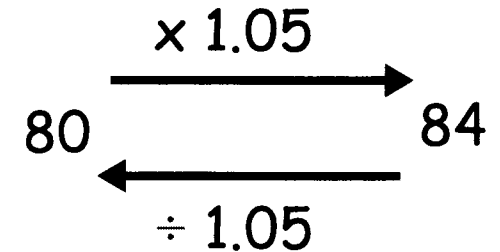
End of Year	Balance	15%	New Balance
1	15000	2250	12750
2	12750		
3			
4			
5			

Quicker Method
$15000 \times 0.85^5 = £6655.60$

Reverse Percentages

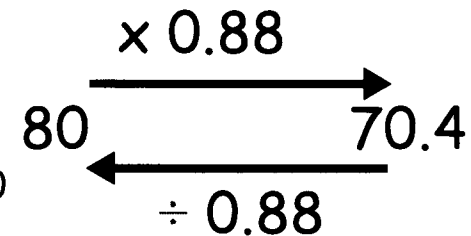
Find the original amount (the 100%) given the changed amount

A coat costs £80. Its price goes up by 5%. What is the new price? $80 \times 1.05 = £84$



After a 5% increase the price of a coat is £84. What was its original price? $84 \div 1.05 = £80$

A coat costs £80. Its price goes down by 12%. What is the new price? $80 \times 0.88 = £70.40$



After a 12% decrease the price of a coat is £70.40. What was its original price? $70.40 \div 0.88 = £80$

1) A bag is in the sale with 15% off. It costs £51. What was its original price? $51 \div 0.85 = £60$

2) The price of a TV has gone up by 8%. The new price is £324. What was its original price? $324 \div 1.08 = £300$

3) A phone is in the sale with 5% off. It costs £285. What was its original price? $285 \div 0.95 = £300$

4) The price of a games console has gone up by 12%. The new price is £380.80. What was its original price?

$$380.80 \div 1.12 = £340$$

Percentages

<p>A) Find a percentage of a quantity. Find 23% of £64. $0.23 \times 64 = \pounds 14.72$</p>	<p>B) Increase by a percentage. Increase £84 by 7%. $1.07 \times 84 = \pounds 89.88$</p>
<p>C) Decrease by a percentage. Decrease £300 by 12.5%. $0.875 \times 300 = \pounds 262.50$</p>	<p>D) Express one quantity as a percentage of another. Peter scored 7 out of 16 in a test. What is his %? $7 \div 16 \times 100 = 43.75\%$</p>
<p>E) 20% off in a sale. TV now costs £304. What was its original price? $304 \div 0.80 = \pounds 380$</p>	<p>F) Prices go up by 12%. New price is £313.60. What was the original price? $313.60 \div 1.12 = \pounds 280$</p>

1) In Year 7 there are 160 students. In a test 48 of the students got level 4. What percentage of the students got level 4? $48 \div 160 \times 100 = 30\%$

2) Find 6% of 4500kg. $0.06 \times 4500 = 270 \text{ kg}$

3) In a sale a shop took 12% off their prices. Calculate the sale price of a television that usually costs £400. $0.88 \times 400 = \pounds 352$

4) A special bag of crisps contains 15% extra free. The bag usually holds 300g. How much does the special bag hold? $1.15 \times 300 = 345 \text{ g}$

5) Hilary bought a coat in the sale. With 20% off it cost £92.80. What was its price before the discount? $92.80 \div 0.80 = \pounds 116$

6) In a class there are 12 girls and 13 boys. What percentage of the class are girls? $12 + 13 = 25$ $12 \div 25 \times 100 = 48\%$

7)

	Red	Blue
Ford	4	6
Vauxhall	6	14

The results show the number of cars in a car park.

a) What percentage of Fords are blue? $\frac{6}{10} \times 100 = 60\%$

b) What percentage of blue cars are Fords? $\frac{6}{20} \times 100 = 30\%$

c) What percentage of cars in the car park are blue Fords? $6 \div 30 \times 100 = 20\%$

8) A bottle of cola contains 15% extra free. The bottle contains 345ml. How much does a bottle normally hold?

$$345 \div 1.15 = 300 \text{ ml}$$

SET 2

$$(1) \quad 0.17 \times 96 = 16.32$$

$$(14) \quad 0.63 \times 700 = 441$$

$$(2) \quad 0.07$$

$$(15) \quad 69 \div 460 \times 100 = 15\%$$

$$(3) \quad 11 \div 20 \times 100 = 55\%$$

$$(4) \quad 1.07 \times 82 = 87.74$$

$$(5) \quad 0.87 \times 280 = 243.6$$

$$(6) \quad 75.60 \div 0.84 = \pounds 90$$

$$(7) \quad \frac{60}{360} \times 100 = 16.6\% \quad 17\%$$

$$(8) \quad 1.23 \times 440 = 541.2$$

$$(9) \quad 9 \div 25 \times 100 = 36\%$$

$$(10) \quad 3000 \times 1.04^7 = \pounds 3947.80$$

$$(11) \quad 356.40 \div 1.08 = 330$$

(12) Canadit say

$$(13) \quad 8000 \times 0.89^5 = 4467.25$$

(14)