1.   Increasing / decreasing a quantity by a given percentage.

2.   Reverse percentage problems.

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1.   Increasing / decreasing a quantity by a given percentage.

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a.   Increase £65 by 14%

First find 14% of £65

£65 × 0.14 = £9.10

Add this to original

£65 + £9.10 = £74.10

Alternative method

100% + 14% = 114%

Find 114% of £65

£65 × 1.14 = £74.10

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b. Increase 125 kg by 32%

Find 132% of 125 kg

125 kg × 1.32 = 165 kg

c. Increase 43 m by 8%

Find 108% of 43m

43m × 1.08 = 46.44 m

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d.   Decrease £84 by 17%

Find 17% of £84

£84 × 0.17 = £14.28

Subtract this from original

£84 − £14.28 = £69.72

Alternative method

100% − 17% = 83%

Find 83% of £84

£84 × 0.83 = £69.72

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e. Decrease 120 kg by 8%

$100\% - 8\% = 92\%$

Find 92% of 120 kg

$120 \text{ kg} \times 0.92 = 110.4 \text{ kg}$

f. Decrease 400m by 35%

$100\% - 35\% = 65\%$

Find 65% of 400m

$400\text{m} \times 0.65 = 260\text{m}$

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2. <u>Reverse Percentage Problems</u>

If your boss gave you a 10% pay rise and then a 10% pay cut, would your pay then be:

a.   More than before the two changes occurred

b.   Less than before the two changes occurred

c.   The same as before the two changes occurred

Suppose original pay was £100

After 10% pay rise it would be £110

After 10% pay cut it would be £99

So pay would be less than original !!

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a.   In a sale with 25% off a coat is priced at £48. What was the original price before the sale?

Original Price $\times 0.75 = £48$

So $£48 \div 0.75 = $ Original Price

$$£48 \div 0.75 = £64$$

We can check this is correct by taking 25% off £64

25% is £16 and £64 - £16 does give £48.

Notice that adding on 25% of £48 does not give the

correct answer 25% of £48 is £12 and £48 + £12 = £60

However, if you take off 25% then £60 - £15 = £45 not

£48 as required.

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b.   After losing 15% of his weight on a diet, a man

     weighed 68 kg. What was his original weight?

     Original weight × 0.85 = 68 kg

     so 68 kg ÷ 0.85 = original weight

         68 kg ÷ 0.85 = 80 kg

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c.   A television is priced at £288 inclusive of 20% VAT

     What is the price exclusive of VAT ?

     Ex VAT price   × 1.20 = £288

     so £288 ÷ 1.20 = Ex VAT price

         £288 ÷ 1.20 = £240

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d.   After a 5% pay rise John had an hourly rate of pay
     of £6.72. What was his previous hourly rate of pay?

     Previous rate × 1.05 = £6.72

     so £6.72 ÷ 1.05 = Previous rate

        £6.72 ÷ 1.05 = £6.40

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