Using Multipliers to Represent Percentage Changes

See video: http://www.waldomaths.com/video/PercMult01/PercMult01.jsp

Problems involving percentage increases or percentage decreases can be solved by working out a multiplying number (a **multiplier**) to use, to represent the percentage change. Here are some examples. Look at them carefully:

Example question 1 Increase £130 by 20%.

Answer: An increase of 20% is an increase from 100% to 120%. To do this you would multiply by $\frac{120}{100}$, which is the same as multiplying by **1.2**. In other words, multiplying an amount by 1.2 is the same as increasing it by 20%. So the number 1.2 is the **multiplier** needed to do the calculation, which now looks like this:

$£130 \times 1.2 =$ **£156**, which is the answer

Example question 2 Decrease 1072 by 17%.

Answer: A decrease of 17% is a decrease from 100% to 83% (100 – 17 = 83). So the multiplier this time is $\frac{83}{100} = \mathbf{0.83}$. So $1072 \times 0.83 =$ **889.76**

Questions

Question 1 What multipliers would represent:

a) An increase of 29%? b) An increase of 8%? c) An increase of 6.9%?
d) An increase of 135%? e) An increase of 0.76%? f) An increase of 17.5%?
g) A decrease of 12%? h) A decrease of 9.1%? i) A decrease of 91%?

Question 2 Use multipliers to perform these calculations

a) Increase £235 by 27% b) Increase 24 grams by 9%
c) Decrease $1120 by 13.5% d) Decrease 0.057 by 55%

Question 3 Sally's investment of £450 has gone up by 30%, while Susie's investment of £650 has gone down by 10%. Who now has the larger amount of money, Sally or Susie?

Question 4 What percentage changes are represented by these multipliers:

a) 1.16? b) 0.74? c) 0.93? d) 0.993? e) 2.7? f) 1.007?

Answers

1 a) 1.29 b) 1.08 c) 1.069 d) 2.35 e) 1.0076
f) 1.175 g) 0.88 h) 0.909 i) 0.09

2 a) $235 \times 1.27 = £298.45$ b) $24 \times 1.09 = 26.16 grams$
c) $1120 \times 0.865 = \$968.80$ d) $0.057 \times 0.45 = 0.02565$

3 They both have the same (450 × 1.3 = £585, 650 × 0.9 = £585)

4 a) 16% increase b) 26% decrease c) 7% decrease
d) 0.7% decrease e) 170% increase f) 0.7% increase