



## Mini-task: Which operation? (2)

### Checking your answers

It is always useful to look at the answer you've got to a calculation – and think about whether it can be right.

Ways of helping you to do this include:

- Estimating answers
- Thinking about whether your answer is reasonable
- Using 'checking back' methods

#### 1. Using an estimated answer – rounding

It is very useful to estimate the *rough size* of the answer you expect to get to a calculation. You can then compare this to your actual answer and see if it looks about right.

##### Example:

You can estimate an answer by rounding the numbers in the calculation to work out *roughly* how big the answer will be:

You are working out: $29 \times 12$	
<i>Round the numbers in the question</i>	$30 \times 10 = 300$ So, the answer to $29 \times 12$ will be <b>about 300</b>

If you would like more practice with rounding numbers and estimating answers, see 'Mini-task: Estimating'

#### 2. Is the answer reasonable? – Using your 'common sense' and knowledge of the world

Often you can use your 'common sense' to think about the answer you have got and whether it seems like it could be right.

Sometimes, when you think about the calculation in everyday terms, you can see that the answer you've got is just too big or too small. This can be especially useful when you have used a calculator to work out the answer.

##### Example:

You are working out: $£160 - £1.20$ and get the answer £40	<i>That can't be right, can it? The answer's much too small!</i>
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#### Look at the answers below and pick out those that don't look right:

Don't actually do the calculations. Just pick out any answers that you think are obviously wrong.

**Q 2(a)**  $£400 + £5.40 = £940$

**Q 2(b)**  $£20 - £4.95 = £15.05$

**Q 2(c)** £140 is shared between 4 people:  $£140 \div 4 = £233$

**Q 2(d)** I buy 6 drinks at £2.50 each:  $£2.50 \times 6 = £15$

**Q 2(e)**  $£20 + £14.95 + £1.50 = £36.45$

- Q 2(f)** I have a length of wood 2 metres long and cut off 1.45 metres for a shelf.  
I work out how much wood I have left  $2\text{ m} - 1.45\text{ m} = 1.97\text{ m}$
- Q 2(g)**  $£2.99 \times 4 = £8.97$
- Q 2(h)**  $£90 \div 5 = £18$

**3. Is the answer reasonable? – Using other information you know**

You can also sometimes use your knowledge of numbers and of the world to help you check answers.

For example, if you are working out discounts or deposits for buying items, you might use a calculator. But you might also be able to use the following facts to help you check your answers:

**50% is the same as a half**  
**25% is the same as a quarter**  
**33% is about a third**

**Example:**

You are working out: A dress costing **£60** is in a sale at **50% off**

You use a calculator to work out how much this dress will cost, and get the answer **£18.00**.

*50% is the same as a half*

$\frac{1}{2}$  of £60 = £30  
 So the dress will be £30 off  
 and the sale price will be £60 - £30 = **£30**

**Use the information about the common percentages above, and your ‘common sense’ knowledge of the world, to check the answers to these questions:**

Which of the answers do you think might be wrong?

- Q 3(a)** A kettle costs £25. It is then in the sale at 50% off.  
Its sale price will be £12.50.
- Q 3(b)** I want to buy an antique piece of furniture costing £240.  
I am asked to pay a deposit of 25%.  
The deposit I need to pay will be £100.
- Q 3(c)** The news reports that gas prices are due to go up by 33%.  
I work out how much I will have to pay for my gas, which used to cost £30 a month.  
I think my new gas bill will be about £33 a month.
- Q 3(d)** In a sale, all the items are reduced by 50%.  
What is the sale price for a suit that used to cost £90?  
Answer: £40.50

#### 4. Using 'checking back' approaches to check your answers

When you get an answer, you can sometimes use a 'checking back' approach to check your answer.

##### Example – subtraction:

$$\begin{array}{r} 357 \\ \underline{209} - \\ 148 \end{array}$$

If you **add** these bottom two numbers, you should get back to the top number (357).

Check:

$$\begin{array}{r} 209 \\ \underline{148} + \\ 357 \end{array}$$

Look at the answers to these calculations and use 'checking back' to work out if the answers given are right or not:

**Q 4(a)**  $\begin{array}{r} 956 \\ \underline{638} - \\ 318 \end{array}$

**Q 4(b)**  $\begin{array}{r} 403 \\ \underline{199} - \\ 304 \end{array}$

**Q 4(c)**  $\begin{array}{r} £5.00 \\ \underline{£2.95} - \\ £2.05 \end{array}$

**Q 4(d)**  $764 - 425 = 331$

*Hint: You might want to lay these out like the ones above*

**Q 4(e)**  $804 - 375 = 429$

**Q 4(f)**  $£10.00 - £4.25 = £6.75$

##### Example – division:

$£120 \div 4 = £30$

If you **multiply** the last two numbers, you should get back to the first number (120)

Check:

$4 \times 30 = 120$

**Q 4(g)**  $120 \div 6 = 20$

**Q 4(h)**  $72 \div 8 = 7$

**Q 4(i)**  $£5.00 \div 4 = £1.25$

**Q 4(j)**  $\begin{array}{r} \underline{14} \\ 3 \ ) \ 42 \end{array}$

*Hint: Which two numbers do you need to multiply to 'check back' here?*

**Q 4(k)**  $\begin{array}{r} \underline{17} \\ 5 \ ) \ 95 \end{array}$

**Q 4(l)**  $\begin{array}{r} \underline{16} \\ 6 \ ) \ 96 \end{array}$

**5. 'Inverse operations'**

If you think of situations using everyday experience, you can often identify what the 'opposite' would be for an action described.

**Example:**

Situation/action	'Opposite' (inverse) action
I have £200 and then <b>receive £10</b>	I <b>give back the £10</b>
So 'receiving £10' and 'giving back £10' are 'opposites' of one another	

**Think about the 'opposite' action in each of these examples:**

*The first one has been done for you.*

Situation/action	'Opposite' action
An item costs £90; then <b>the price goes up by £30</b>	<b>The price goes down by £30</b>
The workers in a factory get <b>a £45 wage cut</b> . What is the new wage of workers who used to earn £400?	
<b>Three friends share</b> £90 winnings between them	
A shop <b>doubles</b> all its prices. What is the price of an item that cost £35 before?	
I <b>pay off £300</b> from a debt of £900	
I have £430 in my account; then <b>save another £120</b>	
A meal costs £25 per person. How much will it cost <b>in total for a group of 4 people</b> ?	
I <b>divide</b> my garden <b>into two equal sized flower beds</b> . The garden is 4 m long. How long is each bed?	

Thinking about practical examples like these, you can see that:

**Adding (+) and subtracting (-) are 'opposites' (inverses) of one another**  
and that

**Multiplying (x) and dividing (÷) are also 'opposites' (inverses) of one another**

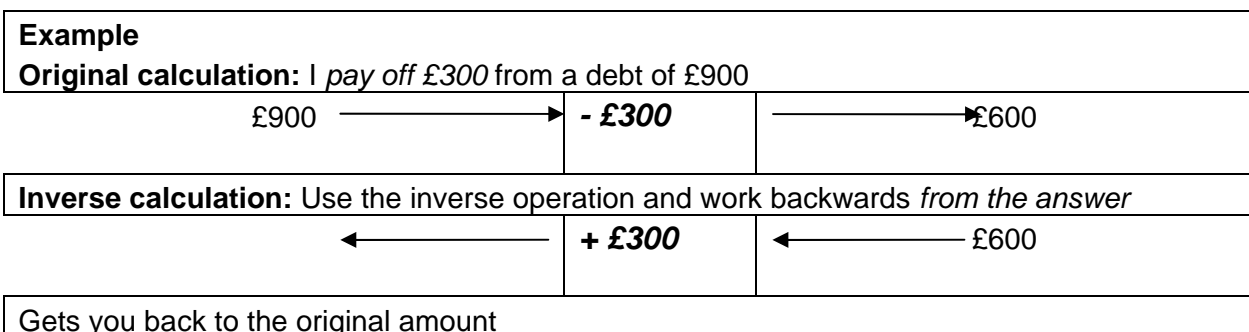
This is why you can use the **inverse operation** to 'check back' on your answers.

Think about the examples in section 3:

To check a subtraction calculation, you added

To check a division, you multiplied.

For some people it helps them to think of this in a visual way:



## Which operation 2: Answer sheet

**Q 2.** The answers that are **not right** are:

- 2(a) *The answer is much too big*  
 2(c) *The answer is much too big*  
 2(f) *1.97m is already nearly 2m, so the answer is too big*  
 2(g) *The answer is too small*

**Q 3.** The answers that are **not right** are:

3(b) The deposit I need to pay will be  
 25% of £240 i.e.  $\frac{1}{4}$  of £240 = £60

3(c) My new gas bill will be about *a third more* than £30  
 $\frac{1}{3}$  of £30 = £10 more a month.  
 So my new bill will be about *£40 a month*.

3(d) The sale price for the suit will be 50% of £90  
 i.e.  $\frac{1}{2}$  of £90 = £45

**Q 4.** The answers that **are not** right are:

4(b)  $\begin{array}{r} 403 \\ 199 - \\ \hline 304 \end{array}$  (Answer should be **204**)

4(d)  $764 - 425 = 331$  (Answer should be **339**)

4(f)  $£10.00 - 4.25 = £6.75$  (Answer should be **£5.75**)

4(h)  $72 \div 8 = 7$  (Answer should be **9**)

4(k)  $95 \div 5 = 17$  Check by working out  **$5 \times 17$**  (Answer should be **19**)

**Q 5.** The opposite actions are:

	Opposite action
An item costs £90; then <b>the price goes up by £30</b>	<b>The price goes down by £30</b>
The workers in a factory get <b>a £45 wage cut</b> . What is the new wage of workers who used to earn £400?	<b>They get a £45 wage rise</b>
<b>Three friends share</b> £90 winnings between them	<b>They pool their winnings</b>
A shop <b>doubles</b> all its prices. What is the price of an item that cost £35 before?	<b>The shop halves their prices</b>
<b>I pay off £300</b> from a debt of £1,200	<b>I borrow another £300</b>
I have £430 in my account; then <b>save another £120</b>	<b>I spend £120 of my savings</b>
A meal costs £25 per person. How much will it cost <b>in total for a group of 4 people</b> ?	<b>What does each person pay?</b>
<b>I divide</b> my garden <b>into two equal sized flower beds</b> . The garden is 4 m long. How long is each bed?	<b>I join the two beds together</b>