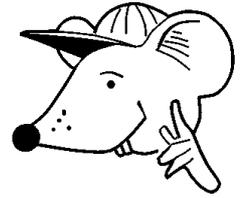




MATHEMATICS



N.S. Yr. 5 P.73

Checking results of calculations.

Equipment

Paper, pencil, calculator with four functions plus square root button (for later use) and, if possible, change of sign button.

MathSphere

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Concepts

This module is concerned with developing techniques for checking calculations. It is very easy for children to assume that because a calculation is done on a calculator, it must be correct. Their faith in the electronics is probably justified, but what about their faith in their own abilities?

We look here at checking using the following methods:

a) Doing the inverse operations. If a division has just been calculated, do the opposite multiplication to check.

Eg. $1\ 880 \div 40 = 47$ Check by doing 47×40 to see if it comes to 1 880

b) Checking a total by adding the numbers in reverse order.

Eg. $65 + 39 + 45 + 23 = 172$

Does $23 + 45 + 39 + 65$ also equal 172 ?

Also by splitting up a column of numbers into groups and totalling each separately.

c) Doing an equivalent calculation.

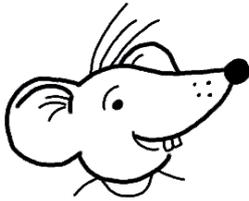
Eg. $57 \times 12 = 684$ Check with (say) $(57 \times 10) + (57 \times 2)$ or $57 \times 2 \times 6$

d) Perform an approximate calculation to see if the answer is in the correct range.

Eg. $28 \times 18 = 504$ Check: $30 \times 20 = 600$

Eg. $789 - 302 = 487$ Check: $800 - 300 = 500$

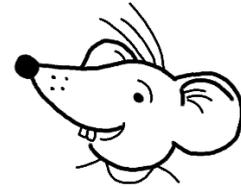
e) Carry out some simple tests such as two even numbers multiplied together always give an even number. The sum of an odd number and an even number is always an odd number.



It is very important to check the work you do on a calculator.

It is very easy to press the wrong buttons and get incorrect answers!

In this module, we are going to look at different ways to check your calculations.



I didn't know Subby had a twin!

Method 1: Do the opposite calculation.

1. Work out these sums and then do the opposite calculation to check your answer.

Eg. in part **a.** work out $467 - 375 = 92$ and then check with $92 + 375$ and see if it comes to **467**

- a.** $467 - 375$ **b.** $2\ 450 \div 50$ **c.** What is half of 254 ? **d.** 45×64
e. Find $\frac{1}{4}$ of 464 **f.** $356 + 438$ **g.** $89 + 967$ **h.** $1\ 080 \div 40$

Method 2: Add numbers in the reverse order.

2. Sometimes we want to check the total of lots of numbers. One way to do this is to add them in the reverse order.

Eg. $76 + 34 + 52 + 84 + 18 = 264$

Check by adding: $18 + 84 + 52 + 34 + 76$

Try this idea with these sums. Use a calculator if you wish.

- a.** $18 + 53 + 97 + 36 + 54 + 13 + 63$
b. $456 + 423 + 873 + 999 + 634 + 321 + 867 + 856 + 956$
c. $645 + 23\ 543 + 18\ 956 + 27\ 645 + 76\ 424 + 26\ 342 + 154 + 874$
d. $896 + 15 + 37 + 648 + 745 + 543 + 61$



Don't forget, the calculator may be able to do sums accurately, but can you type them in without making any mistakes?

Here you can try some different ideas for checking your work.

Method 1: Do the inverse (opposite) calculation.

1. Work out these sums and then do the opposite calculation to check your answer.

Eg. in part **a.** work out $78 + 95 = 173$ and then check with $173 - 95$ and see if it comes to **78**

- a.** $78 + 95$ **b.** What is $\frac{1}{2}$ of 362? **c.** 43×46 **d.** 58×90
e. $456 - 359$ **f.** $2\,450 \div 50$ **g.** $1\,354 + 5\,366$ **h.** What is $\frac{1}{3}$ of 549?

Method 2: Add numbers in the reverse order.

2. Sometimes we want to check the total of lots of numbers. One way to do this is to add them in the reverse order.

Eg. $23 + 74 + 99 + 37 + 84 = 317$

Check by adding: $84 + 37 + 99 + 74 + 23$

Try this idea with these sums. Use a calculator if you wish.

- a.** $56 + 34 + 83 + 66 + 25 + 29 + 15$
b. $845 + 954 + 398 + 488 + 283 + 845 + 438 + 984 + 844$
c. $23\,437 + 482 + 28\,462 + 16\,733 + 26\,733 + 25\,757 + 283 + 933$
d. $993 + 342 + 836 + 65 + 483 + 774 + 93$

It's all quite simple, really!



Here are some columns of numbers to add up.

First of all, add them up on your calculator starting at the top and working down.

Next, add them from the bottom up.

Lastly, divide the column into groups of numbers (about 5 in each group), add each group up and then find the total of the groups.

Column	A	B	C	D
	56	546	1 994	£4.52
	76	752	4 562	£4.56
	38	143	7 876	£4.27
	65	275	4 590	£7.84
	98	972	2 361	£1.77
	45	547	5 709	£7.25
	78	638	6 733	£9.18
	32	235	1 574	£5.94
	45	155	6 599	£5.57
	67	176	1 249	£7.55
	85	587	4 682	£3.76
	46	459	4 533	£7.98
	90	807	6 744	£9.83
	34	943	3 905	£0.06
	15	870	7 623	£8.04
	17	234	5 612	£2.26
	20	102	9 803	£1.44
Top to bottom				
Bottom to top				
Added in groups				

Method 3: Think of an equivalent sum.

In this section, you should think of another sum that will give you the same answer so you can check your calculation.

Eg. Calculate $74 + 97$ This comes to **171**

Now check with another sum that will give the same answer,
for instance $70 + 90 + 4 + 7$

Eg. Calculate $572 - 385 = 187$ Check with $500 + 70 + 2 - 300 - 80 - 5$

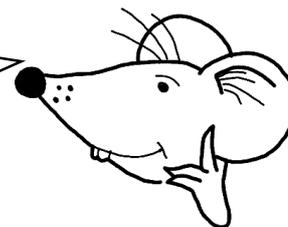
1. a. $86 + 44$ b. $760 - 540$ c. 76×6 d. $634 \div 20$
e. 67×30 f. $750 - 385$ g. 327×30 h. $480 \div 12$

You can discuss your equivalent sums with your friends and see what ideas you had.

For example, $236 \times 15 = (236 \times 10) + (236 \times 5)$

Or $236 \times 3 \times 5$

Or $(200 \times 15) + (30 \times 15) + (6 \times 15)$

**Method 4: Check by doing an approximate sum.**

Eg. Calculate $98 \times 9 = 882$

We can check this is about right by working out $100 \times 9 = 900$

2. Here are some for you to try. Work each one out and then try an approximate sum.

- a. 31×28 b. 16×22 c. 49×19 d. $253 \div 11$
e. $297 + 508$ f. $389 - 156$ g. $1\,932 \div 69$ h. 89×7

3. Here are some more problems. Work them out **on your calculator** and then do an approximate sum to see if your answers are about right.

- a. $(28 + 23) \times 5$ b. $693 - 382$ c. $79 + 22 - 31$
d. $\pounds 98 \div 4$ e. $\pounds 38.50 \times 31$ f. $(88 + 34) \times 21$
g. $2\,473 + 4\,988$ h. $(36 + 14) \times 4$ i. $\pounds 9.80 \times 64$

Method 3: Think of an equivalent sum.

In this section, you should think of another sum that will give you the same answer so you can check your calculation.

Eg. Calculate 83×8 This comes to **664**

Now check with another sum that will give the same answer, for instance $83 \times 2 \times 4$

Eg. Calculate $864 - 398 = 466$ Check with $864 - 400 + 2$

1. a. $75 + 35$ b. $845 - 366$ c. 82×8 d. $735 \div 35$
 e. 95×52 f. $936 - 726$ g. 77×40 h. $960 \div 5$

You can discuss your equivalent sums with your friends and see what ideas you had.

For example, $42 \times 26 = (42 \times 20) + (42 \times 6)$

Or $42 \times 2 \times 13$

Or $(40 \times 26) + (2 \times 26)$

**Method 4: Check by doing an approximate sum.**

Eg. Calculate $72 \times 3 = 216$

We can check this is about right by working out $70 \times 3 = 210$

2. Here are some for you to try. Work each one out and then try an approximate sum.

- a. 47×3 b. 41×9 c. 51×7 d. $572 \div 11$
 e. $582 + 321$ f. $423 - 127$ g. $955 \div 5$ h. 61×61

3. Here are some more problems. Work them out **on your calculator** and then do an approximate sum to see if your answers are about right.

- a. $(18 + 31) \times 6$ b. $512 - 298$ c. $62 + 12 - 41$
 d. $\pounds 165 \div 4$ e. $\pounds 41.20 \times 49$ f. $(57 + 41) \times 34$
 g. $6\,528 + 3\,276$ h. $(41 + 28) \times 8$ i. $\pounds 6.30 \times 45$

Method 5: Know some facts about numbers.

You should know the following facts by now:

If you **add** two or more **even** numbers, the answer is always **even**.

If you **add** two **odd** numbers, the answer is always **even**.

If you **add** three **odd** numbers, the answer is always **odd**.

If you **add** an **odd** number and an **even** number, the answer is always **odd**.

If you **subtract** two **even** numbers, the answer is always **even**.

If you **subtract** two **odd** numbers, the answer is always **even**.

If you **subtract** an **even** number and an **odd** number, the answer is always **odd**.

Say which of these sums will give you an odd answer and which will give you an even answer.



Eg. **1a.** is definitely **even**.

No calculators for this bit please!

- | | | |
|--------------------------|-----------------------------|-----------------------------|
| 1. a. $23 + 7$ | b. $46 + 27$ | c. $56 - 44$ |
| d. $783 + 348$ | e. $600 - 246$ | f. $122 + 73$ |
| g. $73 + 19 + 23$ | h. $21 + 54$ | i. $478 - 452$ |
|
 | | |
| 2. a. $358 + 444$ | b. $677 - 359$ | c. $965 - 358$ |
| d. $746 - 555$ | e. $45 + 37 + 29$ | f. $78 + 29$ |
| g. $738 - 466$ | h. $23 + 33 + 45$ | i. $736 + 248$ |
|
 | | |
| 3. a. $289 + 457$ | b. $349 + 633 + 715$ | c. $457 + 622$ |
| d. $764 + 377$ | e. $684 - 544$ | f. $675 - 483$ |
| g. $856 - 623$ | h. $845 - 248$ | i. $349 + 483 + 837$ |

Method 5: Know some facts about numbers.

You should know the following facts by now:

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If you **add** an **odd** number and an **even** number, the answer is always **odd**.

If you **subtract** two **even** numbers, the answer is always **even**.

If you **subtract** two **odd** numbers, the answer is always **even**.

If you **subtract** an **even** number and an **odd** number, the answer is always **odd**.

Say which of these sums will give you an odd answer and which will give you an even answer.



Eg. **1a.** is definitely **odd**.

No calculators for this bit please!

1. a. $35 + 12$

d. $845 + 562$

g. $91 + 65 + 45$

b. $38 + 81$

e. $733 - 372$

h. $73 + 68$

c. $47 - 31$

f. $472 + 67$

i. $843 - 821$

2. a. $843 + 327$

d. $862 - 476$

g. $723 - 349$

b. $835 - 483$

e. $37 + 53 + 37$

h. $47 + 37 + 67$

c. $844 - 362$

f. $93 + 22$

i. $365 + 924$

3. a. $845 + 284$

d. $822 + 957$

g. $959 - 365$

b. $773 + 821 + 939$

e. $362 - 183$

h. $377 - 287$

c. $338 + 871$

f. $745 - 277$

i. $351 + 353 + 169$

Answers**Page 3**

1. a. 92 b. 49 c. 127 d. 2 880 e. 116 f. 794
 g. 1 056 h. 27
2. a. 334 b. 6 385 c. 174 583 d. 2 945

Page 4

1. a. 173 b. 181 c. 1 978 d. 5 220 e. 97 f. 49
 g. 6 720 h. 183
2. a. 308 b. 6 079 c. 122 820 d. 3 586

Page 5

Col A	Col B	Col C	Col D
907	8 441	86 149	£91.82

Page 6

1. a. 130 b. 220 c. 456 d. 31.7 e. 2 010 f. 365
 g. 9 810 h. 40
2. a. 868 b. 352 c. 931 d. 23 e. 805
 f. 233 g. 28 h. 623
3. a. 255 b. 311 c. 70 d. £24.50 e. £1 193.50
 f. 2 562 g. 7 461 h. 200 i. £627.20

Page 7

1. a. 110 b. 479 c. 656 d. 21 e. 4 940 f. 210
 g. 3 080 h. 192
2. a. 141 b. 369 c. 357 d. 52 e. 903
 f. 296 g. 191 h. 3 721
3. a. 294 b. 214 c. 33 d. £41.25 e. £2 018.80
 f. 3 332 g. 9 804 h. 552 i. £283.50

Page 8

1. a. even b. odd c. even d. odd e. even
 f. odd g. odd h. odd i. even
2. a. even b. even c. odd d. odd
 e. odd f. odd g. even h. odd
 i. even
3. a. even b. odd c. odd d. odd e. even
 f. even g. odd h. odd i. odd

Answers (Contd)

Page 9

1. a. odd b. odd c. even d. odd e. odd
f. odd g. odd h. odd i. even

2. a. even b. even c. even d. even
e. odd f. odd g. even h. odd
i. odd

3. a. odd b. odd c. odd d. odd e. odd
f. even g. even h. even i. odd