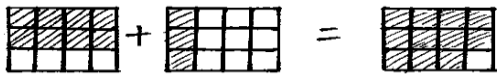| Calculation Guidelines for Gifted and Talented Children Working Beyond Primary Level |
|---|
| ADDITION |

Extend to decimals with up to 2 decimal places, including:
- sums with different numbers of digits;
- totals of more than two numbers.
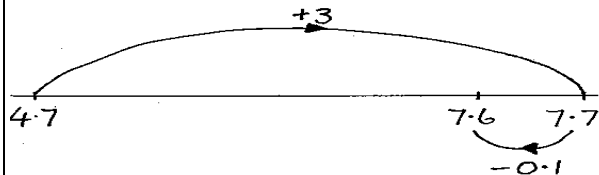
e.g.   76.56 + 312.2 + 5.07 = 398.83

Use diagrams to illustrate adding fractions

$$\frac{2}{3} + \frac{1}{4} = \frac{11}{12}$$

Use compensation by adding too much, and then compensating

$$4.7 + 2.9 = 4.7 + 3 - 0.1$$
$$= 7.7 - 0.1$$
$$= 7.6$$

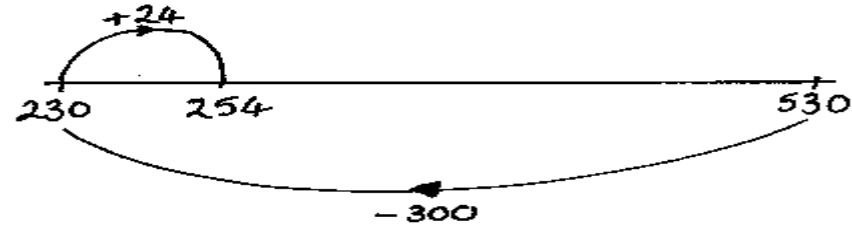| Calculation Guidelines for Gifted and Talented Children Working Beyond Primary Level |
|---|
| SUBTRACTION |

Mental methods
 Use compensation by subtracting too much, and then compensating

Use jottings such as an empty number line to support or explain methods for adding mentally.

$$530 - 276 = 530 - 300 + 24$$
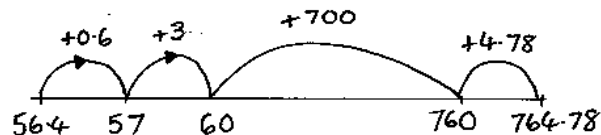$$= 230 + 24$$
$$= 254$$

Pencil and paper procedures (Written methods)

Extend to decimals with up to 2 decimal places, including:
- differences with different numbers of digits
- totals of more than two numbers.

Complementary addition

$$764.78 - 56.4 = 708.38$$

Subtract more complicated fractions
 For Example:

Know that fractions can be added/subtracted if they have the same denominator.

$$\frac{5}{6} - \frac{3}{4}$$

$$\frac{10 - 9}{12} = \frac{1}{12}$$

DIVISION

Pencil and paper procedures (Written methods)	**Pencil and paper procedures (Written methods)**
Use written methods to support, record or explain division of: • a three-digit number by a two-digit number • a decimal with one or two decimal places by a single digit. Refine methods to improve efficiency while maintaining accuracy and understanding. $109.6 \div 8$ is approximately $110 \div 10 = 11$.	Continue to use the same method as in Year 7 and Year 8. Adjust the dividend and divisor by a common factor before the division so that no further adjustment is needed after the calculation e.g. $361.6 \div 0.8$ is equivalent to $3616 \div 8$

Left column:

```
     109.6
 -   80        (10 groups of 8)
     29.6
 -   24          ( 3 )
     5.6
 -   5.6        ( 0.7 )
     0.0
```

Answer: 13.7

Right column:

Use the inverse rule to divide fractions, first converting mixed numbers to improper fractions.

Look at one half of a shape.

How many sixths of the shape can you see? (six)
So, how many sixths in one half? (three)

So $\frac{1}{2} \div \frac{1}{6} = \frac{1}{2} \times \frac{6}{1}$
$= \frac{6}{2}$
$= 3$

Calculation Guidelines for Gifted and Talented Children Working Beyond Primary Level
MULTIPLICATION

Mental methods

Use partitioning

Partition either part of the product e.g. 7.3 x 11   =   (7.3 x 10) + 7.3 = 80.3

OR
Use the grid method of multiplication (as below).

Pencil and paper procedures (Written methods)
Use written methods to support, record or explain multiplication of:
- a three-digit number by a two-digit number
- a decimal with one or two decimal places by a single digit

Grid method
6.24 x 8 is approximately 6 x 8 = 48

x	6	0.2	0.04
8	48	1.6	0.32

= 49.92

Grid lines can become optional