

Methods to use when tackling an Arithmetic Paper.

Fractions

You can only add or subtract fractions when the denominator is the same.

eg. $\frac{3}{5} + \frac{2}{5} = \frac{5}{5} = 1$

When the denominators are not the same, you must find a common denominator.

eg. $\frac{2}{9} + \frac{1}{3} = \frac{2}{9} + \frac{3}{9} = \frac{5}{9}$

Sometimes, you have only to find one

$$\begin{array}{r} 1 \times 3 = 3 \\ 3 \times 3 = 9 \end{array}$$

eg. $\frac{2}{3} + \frac{1}{4} = \frac{8}{12} + \frac{3}{12} = \frac{11}{12}$

Sometimes you have to change both!

$$\begin{array}{r} 2 \times 4 = 8 \\ 3 \times 4 = 12 \end{array}$$

$$\begin{array}{r} 1 \times 3 = 3 \\ 4 \times 3 = 12 \end{array}$$

Fractions of amounts

When finding fractions of amounts, divide by the denominator and multiply by the numerator.

eg: $\frac{3}{7}$ of 1750 = $\xRightarrow{\text{Same thing!}} \frac{3}{7} \times 1750$

$$\begin{array}{r} 250 \\ 7 \overline{) 1750} \end{array}$$

$$250 \times 3 = 750$$

$$\therefore \frac{3}{7} \text{ of } 1750 = 750$$

Mixed Numbers

When adding mixed numbers:

eg: $3\frac{1}{5} + 1\frac{3}{10} \Rightarrow$ make both fractions the same $3\frac{2}{10} + 1\frac{3}{10}$

- then add the numbers, add the fractions and recombine: $\frac{2}{10} + \frac{3}{10} = \frac{5}{10}$

eg $3\frac{2}{10} + 1\frac{3}{10} = 4\frac{5}{10} = 4\frac{1}{2}$
 $3+1=4$

When subtracting mixed numbers

eg: $3\frac{1}{6} - 1\frac{5}{12} \Rightarrow$ - make both fractions the same denominator $3\frac{2}{12} - 1\frac{5}{12}$

Now the tricky bit: because you are subtracting more twelfths than you have you must use your whole number.

eg. $3\frac{2}{12} = 2\frac{14}{12} - 1\frac{5}{12} \left(\frac{14}{12} - \frac{5}{12} = \frac{9}{12}\right)$
 $2-1=1$
 $= 1\frac{9}{12} = 1\frac{3}{4}$

Dividing a fraction by a whole number

These are easy - simply multiply the denominator by the divisor.

eg $\frac{2}{5} \div 3 = \frac{2}{15}$
 $3 \times 5 = 15$

Multiplying decimals by whole ten numbers.

Find a factor pair for the whole ten number that is either 10 or 100.

$$\begin{aligned} \text{eg: } 2.3 \times 50 &= 2.3 \times 10 \times 5 \quad [5 \times 10 = 50] \\ &= 23 \times 5 \\ &= 115 \end{aligned}$$

$$\begin{aligned} 1.7 \times 200 &= 1.7 \times 100 \times 2 \quad [2 \times 100 = 200] \\ &= 170 \times 2 \\ &= 340 \end{aligned}$$

Percentages

To find: one percent $\div$ by 100
ten percent $\div$ by 10
five percent half 10%
fifty percent half the whole number
twenty five percent quarter the whole number

eg:

$$\begin{aligned} 10\% \text{ of } 360 &= 36 \\ 5\% \text{ of } 360 &= 18 \\ 1\% \text{ of } 360 &= 3.6 \end{aligned}$$

$$\begin{aligned} 360 \div 10 &= 36 \\ 36 \div 2 &= 18 \\ 360 \div 100 &= 3.6 \end{aligned}$$

$$\begin{aligned} 50\% \text{ of } 360 &= 180 \\ 25\% \text{ of } 360 &= 90 \end{aligned}$$

$$\begin{aligned} 360 \div 2 &= 180 \\ 360 \div 4 &= 90 \end{aligned}$$

When asked to find a high percentage, e.g. 95% - do not find 95%, find 5% and take it away from the whole.

$$\text{eg. } 45\% \text{ of } 240$$

$$\begin{aligned} \therefore 10\% &= 24 \\ 5\% &= 12 \end{aligned}$$

$$\begin{aligned} 240 - 12 &= 228 \\ 100\% - 5\% &= 95\% \end{aligned}$$

$$\therefore 95\% \text{ of } 240 = 228$$

BIDMAS / BODMAS

The order of operation must be followed.

eg: $27 \div 3 + 4^2$

Next division



$\therefore 27 \div 3 + 16$

$\therefore 9 + 16 = 25$

Finally addition.

There are no brackets so indices must be done first.

BRACKETS
INDICES (POWERS)
DIVISION
MULTIPLICATION
ADDITION
SUBTRACTION

Subtracting a decimal from a whole number.

This can be difficult because you need to exchange across several columns.

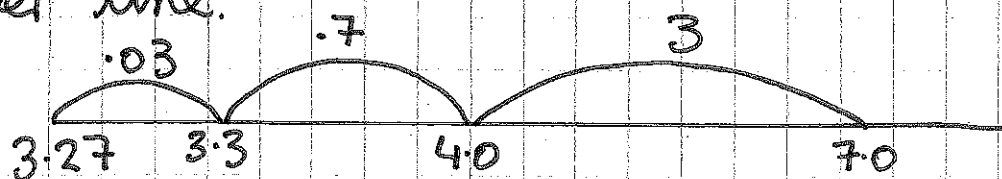
eg: $7 - 3.27$

$$\begin{array}{r} 6.99 \\ 7.00 \\ - 3.27 \\ \hline 3.73 \end{array}$$

reduce each number by $.01$, eg.

$$\begin{array}{r} 6.99 \\ - 3.26 \\ \hline 3.73 \end{array}$$

number line.



$$7.00 - 3.27 = 3.73$$