

## SUBTRACTING BY COLUMNS (Traditional)

**FACT 1:** Arrange the digits in columns by their place values. Subtract the columns from right to left using regrouping.

Subtract 387 from 623:

$$\begin{array}{r}
 & 1 & 13 \\
 & 6 & 2 & 3 \\
 - & 3 & 8 & 7 \\
 \hline
 & 6
 \end{array}
 \rightarrow
 \begin{array}{r}
 & 5 & 11 & \text{regroup} \\
 & 8 & 2 & 3 \\
 - & 3 & 8 & 7 \\
 \hline
 & 2 & 3 & 6
 \end{array}$$

- (a) For 1's: 7 is more than 3; regroup 1 from 10's column to have 13 ones; 13 minus 7 equal 6, put down 6.
- (b) For 10's: 1 is left in 10's column; regroup 1 from 100's column to have 11 tens; 11 minus 8 equal 3, put down 3.
- (c) For 100's: 5 is left in 100's column; 5 minus 3 equal 2; put down 2.
- (d) The difference is 236.

**FACT 2:** Verify the difference by reverse addition.

Subtract 369 from 657.

$$\begin{array}{r}
 & 6 & 5 & 7 \\
 - & 3 & 6 & 9 \\
 \hline
 & 2 & 8 & 8
 \end{array}
 \xrightarrow{\text{Verify}}
 \begin{array}{r}
 & 2 & 8 & 8 \\
 + & 3 & 6 & 9 \\
 \hline
 & 6 & 5 & 7
 \end{array}$$

**FACT 3:** If there is 0 in a column we may have to regroup from farther left.

$$\begin{array}{r}
 & 9 & 9 \\
 & 1 & 40 & 10 & 15 \\
 & 2 & 0 & 0 & 5 \\
 - & & 5 & 0 & 9 \\
 \hline
 & 1 & 4 & 9 & 6
 \end{array}$$

- (a) For 1's: 9 is more than 5; regroup 1 from 10's column. Since there are zeroes in 10's and 100's columns, Regroup starting from 1000's columns as shown above. 15 minus 9 equal 6; put down 6.
- (b) For 10's: 9 is left in 10's column; 9 minus 0 equal 9, put down 9.
- (c) For 100's: 9 is left in 100's column; 9 minus 5 equal 4; put down 4.
- (d) For 1000's: 1 is left in 1000's column; put down 1.
- (e) The difference is 1496.

**FACT 4: We may subtract large numbers the same way.**(a) Subtract:  $4,001,030,352 - 1,946,327,115$ .

$$\begin{array}{r}
 \begin{array}{ccccccccc}
 & 9 & 9 & 10 \\
 & 3 & 10 & 10 & 0 & 10 & 2 & 10 & 4 & 12 \\
 4,0 & 0 & 1,0 & 3 & 0, & 3 & 5 & 2 \\
 1,9 & 4 & 6, & 3 & 2 & 7, & 1 & 1 & 5 \\
 \hline
 2,0 & 5 & 4, & 7 & 0 & 3, & 2 & 3 & 7
 \end{array}
 \end{array}$$

Note that when there are several zeroes following each other in the larger number, regrouping takes place far from the left.

(b) Subtract:  $5,082,359,777 - 3,193,461,857$ .

$$\begin{array}{r}
 \begin{array}{ccccccccc}
 & 9 & 17 & 11 & 12 \\
 & 4 & 10 & 1 & 1 & 15 & 8 & 17 \\
 5,0 & 8 & 2, & 3 & 5 & 9, & 7 & 7 \\
 3,1 & 9 & 3, & 4 & 6 & 1, & 8 & 5 & 7 \\
 \hline
 1,8 & 8 & 8, & 8 & 9 & 7, & 9 & 2 & 0
 \end{array}
 \end{array}$$

**1. Subtract the following by columns. (Check your answers using a calculator)**

(a)	(b)	(c)	(d)	(e)	(f)
$  \begin{array}{r}  9 & 3 \\  - 8 & 9 \\  \hline  \end{array}  $	$  \begin{array}{r}  7 & 5 \\  - 6 & 6 \\  \hline  \end{array}  $	$  \begin{array}{r}  9 & 4 \\  - 5 & 9 \\  \hline  \end{array}  $	$  \begin{array}{r}  8 & 7 \\  - 4 & 7 \\  \hline  \end{array}  $	$  \begin{array}{r}  8 & 6 \\  - 4 & 8 \\  \hline  \end{array}  $	$  \begin{array}{r}  3 & 6 \\  - 2 & 3 \\  \hline  \end{array}  $
_____	_____	_____	_____	_____	_____
(g)	(h)	(i)	(j)		
$  \begin{array}{r}  2 & 6 & 4 \\  - 5 & 9 \\  \hline  \end{array}  $	$  \begin{array}{r}  2 & 9 & 6 \\  - 1 & 9 & 8 \\  \hline  \end{array}  $	$  \begin{array}{r}  1 & 0 & 0 & 0 \\  - 8 & 7 & 5 \\  \hline  \end{array}  $	$  \begin{array}{r}  8 & 0 & 3 & 1 \\  - 5 & 6 & 7 & 3 \\  \hline  \end{array}  $		
_____	_____	_____	_____		

**End of Lesson**