

DIVIDING BY COLUMN

[Note: To avoid confusion with plus sign, the division sign is changed to slash ('/')]

FACT 1: We may divide large numbers by breaking them into ones, tens, hundreds, etc.

Divide, 486 / 2

$$\begin{aligned}
 486 / 2 &= (400 + 80 + 6) / 2 \\
 &= (400 / 2) + (80 / 2) + (6 / 2) \\
 &= 200 + 40 + 3 \\
 &= 243
 \end{aligned}$$

FACT 2: We may use the above procedure by means of columns.

	2 4 3	Quotient
Divisor	2) 4 8 6	Dividend
	- 4	Divide 4 hundreds by 2
	8	Divide 8 tens by 2
	- 8	Divide 6 ones by 2
	6	
	- 6	
	0	No final remainder \rightarrow exact division

The steps are:

- (a) For 100's: 4 divided by 2 is 2; place 2 hundreds in the quotient. Bring down the 8 tens.
- (b) For 10's: 8 divided by 2 is 4; place 4 tens in the quotient. Bring down the 6 ones.
- (c) For 1's: 6 divided by 2 is 3; place 3 ones.
- (d) The quotient is 2 hundreds, 4 tens and 3 ones or, 243.
- (e) There is no remainder meaning the division is exact.

FACT 3: When there is a remainder in a column, it is placed next to the digit from the next column.

Divide, 572 / 2

	2 8 6	Quotient
Divisor	2) 5 7 2	Dividend
	- 4	Divide 4 hundreds by 2
	1 7	Bring down 7
	- 1 6	Divide 17 tens by 2
	1 2	Bring down 2
	- 1 2	Divide 12 ones by 2
	0	No final remainder \rightarrow exact division

The steps are:

- (a) For 100's: 2 goes in 5, 2 times as 4; put down 2 hundreds in quotient. Subtract to get the remainder, 1 hundred.
- (b) For 10's: Bring down 7 making it 17 tens. 2 goes in 17, 8 times as 16; put down 8 tens. Subtract to get the remainder, 1 ten.

(c) For 1's: Bring down 2 making it 12 ones. 2 goes in 12, 6 times as 12; put down 6 ones. There is no final remainder.

The quotient is **286**. There is no remainder meaning the division is exact.

The division may also be done in short form as follows. Here the remainder is calculated mentally.

$$\begin{array}{r} 286 \\ 2 \overline{)51712} \\ \hline \end{array}$$

The steps are (from left to right):

- (a) 2 goes into 5, 2 times. Write 2 in the quotient. Move remainder 1 in front of 7, making it 17.
- (b) 2 goes into 17, 8 times. Write 8 in the quotient. Move remainder 1 in front of 2, making it 12.
- (c) 2 goes into 12, 6 times. Write 6 in the quotient. There is no remainder.
- (d) The quotient is 286.

(e) FACT 4: When the first digit of the dividend cannot be divided, then start the division with the first two digits.

Divide, 564 / 6

$$\begin{array}{r}
 \text{Long Form} \\
 \begin{array}{r}
 9 \ 4 \\
 6) \overline{) 5 \ 6 \ 4} \\
 - 5 \ 4 \\
 \hline
 2 \ 4 \\
 - 2 \ 4 \\
 \hline
 0
 \end{array}
 \end{array}$$

Short Form

The quotient is “94”.

FACT 5: When a number in column cannot be divided, put a 0 in the quotient for that column.

Divide, 723 / 7

Long Form

Short Form

$$\begin{array}{r}
 & 1 & 0 & 3 \\
 7) & 7 & 2 & 3 \\
 & - 7 & & \\
 \hline
 & & 2 & \\
 & - 0 & & \\
 \hline
 & & 2 & 3 \\
 & - 2 & 1 & \\
 \hline
 & & & 2
 \end{array}$$

$$\begin{array}{r} 103 \\ 7 \overline{)702} \\ \hline 02 \end{array} \quad \text{R2}$$

The quotient is “103 R2,” or “103 and $2/7$ ”.

1. Compute the following using long form.

(a) 435 / 5	(f) 826 / 9	(k) 222 / 4
(b) 324 / 4	(g) 800 / 5	(l) 876 / 8
(c) 450 / 6	(h) 315 / 7	(m) 123 / 3
(d) 325 / 7	(i) 384 / 6	(n) 735 / 7
(e) 327 / 3	(j) 612 / 6	(o) 888 / 9

2. Find the quotient using short form.

(a) 363 / 3	(g) 484 / 4	(m) 309 / 3	(s) 2244 / 2
(b) 248 / 2	(h) 936 / 3	(n) 486 / 2	(t) 5005 / 5
(c) 444 / 4	(i) 624 / 2	(o) 844 / 4	(u) 3996 / 3
(d) 57 / 3	(j) 345 / 3	(p) 894 / 6	(v) 8088 / 8
(e) 75 / 5	(k) 732 / 6	(q) 372 / 3	(w) 6072 / 6
(f) 84 / 7	(l) 847 / 7	(r) 992 / 8	(x) 9945 / 5

3. A profit of \$36,363 is to be divided equally among 6 business partners. How much does each partner receive?

4. If 7 computers cost \$13,965 what is the cost per computer?

Answers: 1. (a) 87 (b) 81 (c) 75 (d) 46 R3 (e) 109 (f) 91 R7 (g) 160 (h) 45 (i) 64 (j) 102	3. 6060 and $\frac{3}{4}$ 4. \$1995
(k) 55 R2 (l) 109 R4 (m) 41 (n) 105 (o) 98 R6 2. (a) 121 (b) 124 (c) 111 (d) 19	(p) 149 (q) 124 (r) 122 (s) 1122 (t) 1001 (u) 1332 (v) 1011 (w) 1012 (x) 1989
(e) 15 (f) 12 (g) 121 (h) 312 (i) 115 (k) 122 (l) 121 (m) 103 (n) 243 (o) 211	(p) 149 (q) 124 (r) 122 (s) 1122 (t) 1001 (u) 1332 (v) 1011 (w) 1012 (x) 1989

End of Lesson