Multiplication 2

MULTIPLICATION: 2 DIGIT NUMBER WITH 3 DIGIT NUMBER

1. Solve 325×17

Solution:

Step 1:

$$\begin{array}{r} 3\ 2\ 5 \\ \times\ \ 1\ 7 \\ \hline \end{array}$$

$5 \times 7 = 35$, write down 5, carry over 3

Step 2:

$$\begin{array}{r} 3\ 2\ 5 \\ \times\ \ 1\ 7 \\ \hline \end{array}$$

$2 \times 7 + 5 \times 1 + 3 = 22$ write down 2, carry over 2

Step 3:

$$\begin{array}{r} 3\ 2\ 5 \\ \times\ \ 1\ 7 \\ \hline \end{array}$$

$3 \times 7 + 2 \times 1 + 2 = 25$ write down 5, carry over 2

Step 4:

$$\begin{array}{r} 3\ 2\ 5 \\ \times\ \ 1\ 7 \\ \hline \end{array}$$

$3 \times (1) + 2 = 3 + 2 = 5$ write down 5

$\therefore 325 \times 17 = 5525$

2. Solve 675×78

Solution:

Step 1:

$$\begin{array}{r} 6\ 7\ 5 \\ \updownarrow \\ 7\ 8 \\ \hline \end{array}$$

$5 \times 8 = 40$, write down 0 carry over 4

Step 2:

$$\begin{array}{r} 6\ 7\ 5 \\ \times\ \ \times \\ 7\ 8 \\ \hline \end{array}$$

$7 \times 8 + 5 \times 7 + 4 = 95$ write down 5, carry over 9

Step 3:

$$\begin{array}{r} 6\ 7\ 5 \\ \times\ \ \times \\ 7\ 8 \\ \hline \end{array}$$

$6 \times 8 + 7 \times 7 + 9 = 106$ write down 6, carry over 10

Step 4:

$$\begin{array}{r} 6\ 7\ 5 \\ \times \\ 7\ 8 \\ \hline \end{array}$$

$6 \times 7 + 10 = 52$ write down 52

$\therefore 675 \times 78 = 52650$

3. Simplify 95×847

Solution:

Step 1:

$$\begin{array}{r} 9\ 5 \\ \updownarrow \\ 8\ 4\ 7 \\ \hline \end{array}$$

$5 \times 7 = 35$, write down 5, carry over 3

Step 2:

$$\begin{array}{r} 9\ 5 \\ \nwarrow\!\!\searrow\ \ \swarrow\!\!\nearrow \\ 8\ 4\ 7 \\ \hline \end{array}$$

$9 \times 7 + 5 \times 4 + 3 = 86$ write down 6, carry over 8

Step 3:

$$\begin{array}{r} 9\ 5 \\ \swarrow\!\!\nearrow\ \ \nwarrow\!\!\searrow \\ 8\ 4\ 7 \\ \hline \end{array}$$

$8 \times 5 + 9 \times 4 + 8 = 84$ write down 4, carry over 9

Step 4:

$$\begin{array}{r} 9\ 5 \\ \swarrow\!\!\nearrow \\ 8\ 4\ 7 \\ \hline \end{array}$$

$8 \times 9 + 8 = 80$ write down 90

$\therefore 95 \times 847 = 80465$

4. Simplify 275×64

Solution:

Step 1:

$$\begin{array}{r} 2\ 7\ 5 \\ \updownarrow \\ 6\ 4 \\ \hline \end{array}$$

$5 \times 4 = 20$, write down 0 carry over 2

Step 2:

$$\begin{array}{r} 2\ 7\ 5 \\ \times\ \ \ \\ 6\ 4 \\ \hline \end{array}$$

$7 \times 4 + 6 \times 5 + 2 = 60$ write down 0, carry over 6

Step 3:

$$\begin{array}{r} 2\ 7\ 5 \\ \times\ \ \ \\ 6\ 4 \\ \hline \end{array}$$

$2 \times 4 + 7 \times 6 + 6 = 56$ write down 6, carry over 5

Step 4:

$$\begin{array}{r} 2\ 7\ 5 \\ \times \\ 6\ 4 \\ \hline \end{array}$$

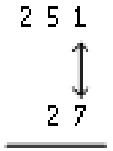
$2 \times 6 + 5 = 17$ write down 17

$\therefore 275 \times 64 = 17600$

5. Solve $251 \times 27 + 362 \times 34$

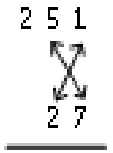
Solution:

Step 1:



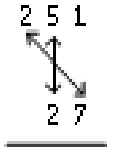
$1 \times 7 = 7$, write down 7

Step 2:



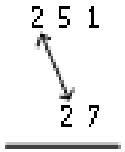
$5 \times 7 + 2 \times 1 = 37$, write down 7 carry over 3

Step 3:



$2 \times 7 + 5 \times 2 + 3 = 27$ write down 7, carry over 2

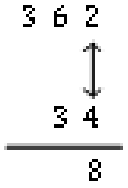
Step 4:



$2 \times 2 + 2 = 6$ write down 6

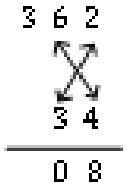
$\therefore 251 \times 27 = 6777$

Step 1:



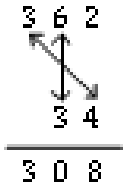
$2 \times 4 = 8$, write down 8

Step 2:



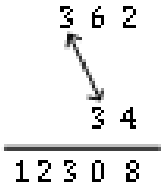
$6 \times 4 + 2 \times 3 = 30$ write down 0, carry over 3

Step 3:



$3 \times 4 + 6 \times 3 + 3 = 33$ write down 3, carry over 3

Step 4:



$3 \times 3 + 3 = 12$ write down 12

$\therefore 362 \times 34 = 12308$

So, $251 \times 27 = 362 \times 34 = 6777 + 12308 = 19085$

MULTIPLICATION: 3 DIGIT NUMBERS

1. Simplify 321×132

Solution:

Step 1:

$$\begin{array}{r} 3\ 2\ 1 \\ \times\ 1\ 3\ 2 \\ \hline 2 \end{array}$$

$1 \times 2 = 2$

Step 2:

$$\begin{array}{r} 3\ 2\ 1 \\ \times\ 1\ 3\ 2 \\ \hline 7\ 2 \end{array}$$

$2 \times 2 + 3 \times 1 = 7$

Step 3:

$$\begin{array}{r} 3\ 2\ 1 \\ \times\ 1\ 3\ 2 \\ \hline 3\ 7\ 2 \end{array}$$

$3 \times 2 + 1 \times 1 + 2 \times 3 = 13$ (write down 3, carry over 1)

Step 4:

$$\begin{array}{r} 3\ 2\ 1 \\ \times\ 1\ 3\ 2 \\ \hline 2\,3\ 7\ 2 \end{array}$$

$3 \times 3 + 1 \times 2 + 1 = 12$ (write down 2, carry over 1)

Step 5:

$$\begin{array}{r} 3\ 2\ 1 \\ \times\ 1\ 3\ 2 \\ \hline 4\,2\,3\ 7\ 2 \end{array}$$

$3 \times 1 + 1 = 4$

$\therefore 321 \times 132 = 42372$

2. Simplify 275×526

Solution:

Step 1:

$$\begin{array}{r} 2\ 7\ 5 \\ \times\ 5\ 2\ 6 \\ \hline \end{array}$$

$5 \times 6 = 30$, write down 0, carry over 3

Step 2:

$$\begin{array}{r} 2\ 7\ 5 \\ \times\ 5\ 2\ 6 \\ \hline \end{array}$$

$7 \times 6 + 5 \times 2 + 3 = 55$, write down 5, carry over 5

Step 3:

$$\begin{array}{r} 2\ 7\ 5 \\ \times\ 5\ 2\ 6 \\ \hline \end{array}$$

$2 \times 6 + 5 \times 5 + 7 \times 2 + 5 = 56$ write down 6, carry over 5

Step 4:

$$\begin{array}{r} 2\ 7\ 5 \\ \times\ 5\ 2\ 6 \\ \hline \end{array}$$

$2 \times 2 + 7 \times 5 + 5 = 44$, write down 4 carry over 4

Step 5:

$$\begin{array}{r} 2\ 7\ 5 \\ \times\ 5\ 2\ 6 \\ \hline \end{array}$$

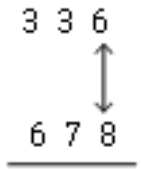
$2 \times 5 + 4 = 14$, write down 14

$\therefore 275 \times 526 = 144650$

3. Simplify 336×678

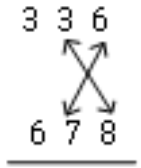
Solution:

Step 1:



$6 \times 8 = 48$, write down 8, carry over 4

Step 2:

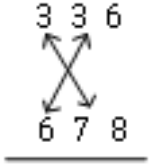


$3 \times 8 + 6 \times 7 + 4 = 70$ write down 0, carry over 7

Step 3:

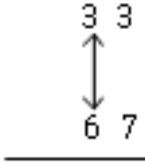
$3 \times 8 + 6 \times 6 + 3 \times 7 + 7 = 88$ write down 8, carry over 8

Step 4:



$3 \times 7 + 6 \times 3 + 8 = 47$ write down 7, carry over 4

Step 5:



$3 \times 6 + 4 = 22$, write down 22

$\therefore 336 \times 678 = 227808$

4. Simplify 569×952

Solution:

Step 1:

$$\begin{array}{r} 5\ 6\ 9 \\ \times\ 9\ 5\ 2 \\ \hline \end{array}$$

$9 \times 2 = 18$, write down 8, carry over 1

Step 2:

$$\begin{array}{r} 5\ 6\ 9 \\ \times\ 9\ 5\ 2 \\ \hline \end{array}$$

$6 \times 2 + 9 \times 5 + 1 = 58$ write down 8, carry over 5

Step 3:

$$\begin{array}{r} 5\ 6\ 9 \\ \times\ 9\ 5\ 2 \\ \hline \end{array}$$

$5 \times 2 + 9 \times 9 + 6 \times 5 + 5 = 126$ write down 6, carry over 12

Step 4:

$$\begin{array}{r} 5\ 6\ 9 \\ \times\ 9\ 5\ 2 \\ \hline \end{array}$$

$5 \times 5 + 6 \times 9 + 12 = 91$ write down 1, carry over 9

Step 5:

$$\begin{array}{r} 5\ 6\ 9 \\ \times\ 9\ 5\ 2 \\ \hline \end{array}$$

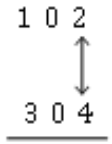
$5 \times 9 + 9 = 54$ write down 54

$\therefore 569 \times 952 = 541688$

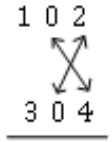
5. Simplify $102\times304+207\times121$

Solution:

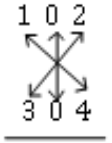
102×304

Step 1: 

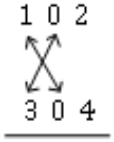
$2\times4=8$, write down 8

Step 2: 

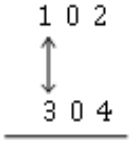
$0\times4+2\times0=0$, write down 0

Step 3: 

$1\times4+2\times3+0\times0=10$ write down 0, carry over 1

Step 4: 

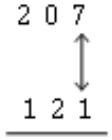
$1\times0+3\times0+1=1$, write down 1

Step 5: 

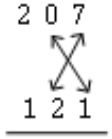
$1\times3=3$, write down 3

$\therefore 102\times304=31008$

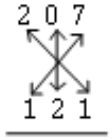
207×121

Step 1: 

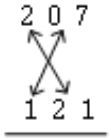
$7\times1=7$, write down 7

Step 2: 

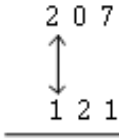
$0\times1+7\times2=14$, write down 4 carry over 1

Step 3: 

$2\times1+7\times1+0\times2+1=10$ write down 0 carry over 1

Step 4: 

$2\times2+1\times0+1=5$ write down 5

Step 5: 

$2\times1=2$

$\therefore 207\times121=25047$

$102\times304+207\times121$

= 31008 + 25077 = 56055

MULTIPLICATION – COMPLEMENTARY NUMBERS

Numbers having the same digits except the right most digits whose sum is 10 are called complementary pairs.

For example: 83, 87; 114, 116, 342, 348 are complementary pairs.

To multiply complementary numbers, there are 2 steps. If the numbers are 94 and 96 multiply the right most digits 4 X 6 = 24

Multiply the first number by the number one up 9 X 10 = 90

Therefore, 94 X 96 = 9024

1. Simplify 32×38

Solution:

$3 \times 4 = 12$

$2 \times 8 = 16$

$\therefore 32 \times 38 = 1216$

2. Simplify 87×83

Solution:

$8 \times 9 = 72$

$7 \times 3 = 21$

$\therefore 87 \times 83 = 7221$

3. Simplify 126×124

Solution:

$12 \times 13 = 156$

$6 \times 4 = 24$

$\therefore 126 \times 124 = 15624$

4. Simplify 243×247

Solution:

$24 \times 25 = 600$

$3 \times 7 = 21$

$\therefore 243 \times 247 = 60021$

5. Simplify $92 \times 98 + 67 \times 63$

Solution:

$92 \times 98 = 9016$

$$\begin{bmatrix} 9 \times 10 = 90 \\ 2 \times 8 = 16 \end{bmatrix}$$

$67 \times 63 = 4221$

$$\begin{bmatrix} 6 \times 7 = 42 \\ 7 \times 3 = 21 \end{bmatrix}$$

$\therefore 92 \times 98 + 67 \times 63$

$= 9016 + 4221 = 13237$