LONG MULTIPLICATION

A MULTIPLICATION TABLES FOR MULTIPLES OF 10

A.1 MULTIPLYING FOR MULTIPLES OF 10

Ex 1:

$$3 \times 50 = \boxed{150}$$

Answer:

- $3 \times 5 = 15$
- $3 \times 50 = 150$

Ex 2:

$$4 \times 20 = \boxed{80}$$

Answer:

- $4 \times 2 = 8$
- $4 \times 20 = 80$

Ex 3:

$$2 \times 70 = \boxed{140}$$

Answer:

- $2 \times 7 = 14$
- $2 \times 70 = 140$

Ex 4:

$$3 \times 60 = \boxed{180}$$

Answer:

- $3 \times 6 = 18$
- $3 \times 60 = 180$

Ex 5:

$$5 \times 40 = \boxed{200}$$

Answer:

- $5 \times 4 = 20$
- $5 \times 40 = 200$

Ex 6:

$$6 \times 50 = \boxed{300}$$

Answer:

- $6 \times 5 = 30$
- $6 \times 50 = 300$

Ex 7:

$$4 \times 90 = \boxed{360}$$

Answer:

- $4 \times 9 = 36$
- $4 \times 90 = 360$

A.2 MULTIPLYING FOR MULTIPLES OF 10

Ex 8:

$$30 \times 5 = \boxed{150}$$

Answer:

- $3 \times 5 = 15$
- $30 \times 5 = 150$

Ex 9:

$$40 \times 6 = \boxed{240}$$

Answer:

- $4 \times 6 = 24$
- $40 \times 6 = 240$

Ex 10:

$$50 \times 7 = \boxed{350}$$

Answer:

- $5 \times 7 = 35$
- $50 \times 7 = 350$

Ex 11:

$$20 \times 8 = \boxed{160}$$

Answer:

- $2 \times 8 = 16$
- $20 \times 8 = 160$

Ex 12:

$$60 \times 4 = \boxed{240}$$

Answer:

- $6 \times 4 = 24$
- $60 \times 4 = 240$

Ex 13:

$$70 \times 3 = \boxed{210}$$

Answer:

- $7 \times 3 = 21$
- $70 \times 3 = 210$

Ex 14:

$$90 \times 2 = \boxed{180}$$

Answer:

- $9 \times 2 = 18$
- $90 \times 2 = 180$

A.3 MULTIPLYING FOR MULTIPLES OF 100

Ex 15:

$$900 \times 2 = \boxed{1800}$$

Answer:

- $9 \times 2 = 18$
- $900 \times 2 = 1\,800$

Ex 16:

$$700 \times 3 = \boxed{2100}$$

Answer:

- $7 \times 3 = 21$
- $700 \times 3 = 2\,100$

Ex 17:

$$400 \times 5 = \boxed{2000}$$

Answer:

- $4 \times 5 = 20$
- $400 \times 5 = 2\,000$

Ex 18:

$$600 \times 4 = \boxed{2400}$$

Answer:

- $6 \times 4 = 24$
- $600 \times 4 = 2\,400$

Ex 19:

$$800 \times 6 = \boxed{4800}$$

Answer:

- $8 \times 6 = 48$
- $800 \times 6 = 4\,800$

Ex 20:

$$500 \times 7 = \boxed{3500}$$

Answer:

- $5 \times 7 = 35$
- $500 \times 7 = 3\,500$

A.4 MULTIPLYING BY TENS

Ex 21: We know that $25 \times 3 = 75$.

$$25 \times 30 = \boxed{750}$$

Answer:

- $25 \times 3 = 75$
- $25 \times 30 = 750$

Ex 22: We know that $12 \times 4 = 48$.

$$12 \times 40 = \boxed{480}$$

Answer:

- $12 \times 4 = 48$
- $12 \times 40 = 480$

Ex 23: We know that $31 \times 2 = 62$.

$$31 \times 20 = \boxed{620}$$

Answer:

- $31 \times 2 = 62$
- $31 \times 20 = 620$

Ex 24: We know that $15 \times 6 = 90$.

$$15 \times 60 = \boxed{900}$$

Answer:

- $15 \times 6 = 90$
- $15 \times 60 = 900$

B LONG MULTIPLICATION BY ONE-DIGIT NUMBERS

B.1 MULTIPLYING 2 DIGIT NUMBERS TIMES 1 DIGIT NUMBERS

Ex 25: Set up a column multiplication to calculate:

$$15 \times 6 = \boxed{90}$$

Answer:

- Set up

$$\begin{array}{r} 1\,5 \\ \times\ \ 6 \\ \hline \end{array}$$

- $6 \times 5 = 30$

$$\begin{array}{r} {\scriptstyle 3} \\ 1\,5 \\ \times\ \ 6 \\ \hline 0 \end{array}$$

- $6 \times 1 + 3 = 6 + 3 = 9$

$$\begin{array}{r} {\scriptstyle 3} \\ 1\,5 \\ \times\ \ 6 \\ \hline 9\,0 \end{array}$$

- So, $15 \times 6 = 90$

$$\begin{array}{r} {\scriptstyle 3} \\ 1\,5 \\ \times\ \ 6 \\ \hline 9\,0 \end{array}$$

Ex 26: Set up a column multiplication to calculate:

$$35 \times 4 = \boxed{140}$$

Answer:

- Set up

$$\begin{array}{r} 3\,5 \\ \times\ \ 4 \\ \hline \end{array}$$

- $4 \times 5 = 20$

$$\begin{array}{r} {\scriptstyle 2} \\ 3\,5 \\ \times\ \ 4 \\ \hline 0 \end{array}$$

- $4 \times 3 + 2 = 12 + 2 = 14$

$$\begin{array}{r} {\scriptstyle 2} \\ 3\,5 \\ \times\ \ 4 \\ \hline 1\,4\,0 \end{array}$$

- So, $35 \times 4 = 140$

$$\begin{array}{r} {\scriptstyle 2} \\ 3\,5 \\ \times\ \ 4 \\ \hline 1\,4\,0 \end{array}$$

Ex 27: Set up a column multiplication to calculate:

$$63 \times 5 = \boxed{315}$$

Answer:

- Set up

$$\begin{array}{r} 6\,3 \\ \times\ \ 5 \\ \hline \end{array}$$

- $5 \times 3 = 15$

$$\begin{array}{r} {\scriptstyle 1} \\ 6\,3 \\ \times\ \ 5 \\ \hline 5 \end{array}$$

- $5 \times 6 + 1 = 30 + 1 = 31$

$$\begin{array}{r} {\scriptstyle 1} \\ 6\,3 \\ \times\ \ 5 \\ \hline 3\,1\,5 \end{array}$$

- So, $63 \times 5 = 315$

$$\begin{array}{r} {\scriptstyle 1} \\ 6\,3 \\ \times\ \ 5 \\ \hline 3\,1\,5 \end{array}$$

Ex 28: Set up a column multiplication to calculate:

$$74 \times 7 = \boxed{518}$$

Answer:

- Set up

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

- $7 \times 4 = 28$

$$\begin{array}{r} {\scriptstyle 2} \\ 7\,4 \\ \times\ \ 7 \\ \hline 8 \end{array}$$

- $7 \times 7 + 2 = 49 + 2 = 51$

$$\begin{array}{r} {\scriptstyle 2} \\ 7\,4 \\ \times\ \ 7 \\ \hline 5\,1\,8 \end{array}$$

- So, $74 \times 7 = 518$

$$\begin{array}{r} {\scriptstyle 2} \\ 7\,4 \\ \times\ \ 7 \\ \hline 5\,1\,8 \end{array}$$

Ex 29: Set up a column multiplication to calculate:

$$87 \times 9 = \boxed{783}$$

Answer:

- Set up

$$\begin{array}{r} 87 \\ \times\ \ 9 \\ \hline \end{array}$$

- $9 \times 7 = 63$

$$\begin{array}{r} {\scriptstyle 6} \\ 87 \\ \times\ \ 9 \\ \hline 3 \end{array}$$

- $9 \times 8 + 6 = 72 + 6 = 78$

$$\begin{array}{r} {\scriptstyle 6} \\ 87 \\ \times\ \ 9 \\ \hline 783 \end{array}$$

- So, $87 \times 9 = 783$

$$\begin{array}{r} {\scriptstyle 6} \\ 87 \\ \times\ \ 9 \\ \hline 783 \end{array}$$

B.2 MULTIPLYING 3 DIGIT NUMBERS TIMES 1 DIGIT NUMBERS

Ex 30: Set up a column multiplication to calculate:

$$765 \times 2 = \boxed{1530}$$

Answer:

- Set up

$$\begin{array}{r} 765 \\ \times\ \ 2 \\ \hline \end{array}$$

- $2 \times 5 = 10$

$$\begin{array}{r} {\scriptstyle 1} \\ 765 \\ \times\ \ 2 \\ \hline 0 \end{array}$$

- $2 \times 6 + 1 = 12 + 1 = 13$

$$\begin{array}{r} {\scriptstyle 1\ 1} \\ 765 \\ \times\ \ 2 \\ \hline 30 \end{array}$$

- $2 \times 7 + 1 = 14 + 1 = 15$

$$\begin{array}{r} {\scriptstyle 1\ 1} \\ 765 \\ \times\ \ 2 \\ \hline 1530 \end{array}$$

- So, $765 \times 2 = 1530$

$$\begin{array}{r} {\scriptstyle 1\ 1} \\ 765 \\ \times\ \ 2 \\ \hline 1530 \end{array}$$

Ex 31: Set up a column multiplication to calculate:

$$453 \times 4 = \boxed{1812}$$

Answer:

- Set up

$$\begin{array}{r} 453 \\ \times\ \ 4 \\ \hline \end{array}$$

- $4 \times 3 = 12$

$$\begin{array}{r} {\scriptstyle 1} \\ 453 \\ \times\ \ 4 \\ \hline 2 \end{array}$$

- $4 \times 5 + 1 = 20 + 1 = 21$

$$\begin{array}{r} {\scriptstyle 2\ 1} \\ 453 \\ \times\ \ 4 \\ \hline 12 \end{array}$$

- $4 \times 4 + 2 = 16 + 2 = 18$

$$\begin{array}{r} {\scriptstyle 2\ 1} \\ 453 \\ \times\ \ 4 \\ \hline 1821 \end{array}$$

- So, $453 \times 4 = 1812$

$$\begin{array}{r} {\scriptstyle 1\ 2} \\ 453 \\ \times\ \ 4 \\ \hline 1812 \end{array}$$

Ex 32: Set up a column multiplication to calculate:

$$652 \times 5 = \boxed{3260}$$

Answer:

- Set up

$$\begin{array}{r} \\ 652 \\ \times\quad 5 \\ \hline \end{array}$$

- $5 \times 2 = 10$

$$\begin{array}{r} 1 \\ 652 \\ \times\quad 5 \\ \hline 0 \end{array}$$

- $5 \times 5 + 1 = 25 + 1 = 26$

$$\begin{array}{r} 26 \\ 652 \\ \times\quad 5 \\ \hline 60 \end{array}$$

- $5 \times 6 + 2 = 30 + 2 = 32$

$$\begin{array}{r} 32 \\ 652 \\ \times\quad 5 \\ \hline 3260 \end{array}$$

- So, $652 \times 5 = 3260$

$$\begin{array}{r} 32 \\ 652 \\ \times\quad 5 \\ \hline 3260 \end{array}$$

Ex 33: Set up a column multiplication to calculate:

$$341 \times 9 = \boxed{3069}$$

Answer:

- Set up

$$\begin{array}{r} \\ 341 \\ \times\quad 9 \\ \hline \end{array}$$

- $9 \times 1 = 9$

$$\begin{array}{r} \\ 341 \\ \times\quad 9 \\ \hline 9 \end{array}$$

- $9 \times 4 = 36$

$$\begin{array}{r} 3 \\ 341 \\ \times\quad 9 \\ \hline 69 \end{array}$$

- $9 \times 3 + 3 = 27 + 3 = 30$

$$\begin{array}{r} 3 \\ 341 \\ \times\quad 9 \\ \hline 3069 \end{array}$$

- So, $341 \times 9 = 3069$

$$\begin{array}{r} 3 \\ 341 \\ \times\quad 9 \\ \hline 3069 \end{array}$$

C LONG MULTIPLICATION BY MULTI-DIGIT NUMBERS

C.1 MULTIPLYING 2 DIGIT NUMBERS TIMES 2 DIGIT NUMBERS

Ex 34:

$$\begin{array}{r} 37 \\ \times\ 12 \\ \hline \\ \ . \\ \hline \end{array}$$

$$37 \times 12 = \boxed{444}$$

Answer:

-

$$\begin{array}{r} 37 \\ \times\ 12 \\ \hline \ . \\ \hline \end{array}$$

- $37 \times 2 = 74$

$$\begin{array}{r} 37 \\ \times\ 12 \\ \hline 74 \\ \ . \\ \hline \end{array}$$

- $37 \times 1 = 37$

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

- $74 + 370 = 444$

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

Ex 35:

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

$45 \times 56 = \boxed{2520}$

Answer:

-

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

- $45 \times 6 = 270$

$$\begin{array}{r} 4\ 5 \\ \times\ 5\ 6 \\ \hline 2\ 7\ 0 \\ \hline \end{array}$$

- $45 \times 5 = 225$

$$\begin{array}{r} 4\ 5 \\ \times\ 5\ 6 \\ \hline 2\ 7\ 0 \\ 2\ 2\ 5\ \cdot \\ \hline \end{array}$$

- $270 + 2250 = 2520$

$$\begin{array}{r} 4\ 5 \\ \times\ 5\ 6 \\ \hline 2\ 7\ 0 \\ 2\ 2\ 5\ \cdot \\ \hline 2\ 5\ 2\ 0 \end{array}$$

Ex 36:

$$\begin{array}{r} 3\ 5 \\ \times\ 2\ 9 \\ \hline \\ \hline \end{array}$$

$35 \times 29 = \boxed{1015}$

Answer:

-

$$\begin{array}{r} 3\ 5 \\ \times\ 2\ 9 \\ \hline \\ \hline \end{array}$$

- $35 \times 9 = 315$

$$\begin{array}{r} 3\ 5 \\ \times\ 2\ 9 \\ \hline 3\ 1\ 5 \\ \hline \end{array}$$

- $35 \times 2 = 70$

$$\begin{array}{r} 3\ 5 \\ \times\ 2\ 9 \\ \hline 3\ 1\ 5 \\ 7\ 0\ \cdot \\ \hline \end{array}$$

- $315 + 700 = 1015$

$$\begin{array}{r} 3\ 5 \\ \times\ 2\ 9 \\ \hline 3\ 1\ 5 \\ 7\ 0\ \cdot \\ \hline 1\ 0\ 1\ 5 \end{array}$$

Ex 37:

$$\begin{array}{r} 9\ 9 \\ \times\ 9\ 9 \\ \hline \\ \hline \end{array}$$

$99 \times 99 = \boxed{9801}$

Answer:

$$\begin{array}{r} 9\ 9 \\ \times\ 9\ 9 \\ \hline \\ \hline \end{array}$$

-

- $99 \times 9 = 891$

$$\begin{array}{r} 9\ 9 \\ \times\ 9\ 9 \\ \hline 8\ 9\ 1 \\ \cdot \\ \hline \end{array}$$

- $99 \times 9 = 891$

$$\begin{array}{r} 9\ 9 \\ \times\ 9\ 9 \\ \hline 8\ 9\ 1 \\ 8\ 9\ 1\ \cdot \\ \hline \end{array}$$

- $891 + 8910 = 9801$

$$\begin{array}{r} 9\ 9 \\ \times\ 9\ 9 \\ \hline 8\ 9\ 1 \\ 8\ 9\ 1\ \cdot \\ \hline 9\ 8\ 0\ 1 \end{array}$$

C.2 MULTIPLYING 3 DIGIT NUMBERS TIMES 2 DIGIT NUMBERS

Ex 38:

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

$274 \times 12 = \boxed{3288}$

Answer:

-

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

- $274 \times 2 = 548$

$$\begin{array}{r} 2\ 7\ 4 \\ \times\ \ 1\ 2 \\ \hline 5\ 4\ 8 \\ \cdot \\ \hline \end{array}$$

- $274 \times 1 = 274$

$$\begin{array}{r} 2\ 7\ 4 \\ \times\ \ 1\ 2 \\ \hline 5\ 4\ 8 \\ 2\ 7\ 4\ \cdot \\ \hline \end{array}$$

- $548 + 2740 = 3288$

$$\begin{array}{r} 2\ 7\ 4 \\ \times\ \ 1\ 2 \\ \hline 5\ 4\ 8 \\ 2\ 7\ 4\ \cdot \\ \hline 3\ 2\ 8\ 8 \end{array}$$

Ex 39:

$$\begin{array}{r} 4\ 5\ 6 \\ \times\ \ 4\ 1 \\ \hline \\ \\ \hline \end{array}$$

$456 \times 41 = \boxed{18720}$

Answer:

-

$$\begin{array}{r} 4\ 5\ 6 \\ \times\ \ 4\ 1 \\ \hline \\ \cdot \\ \hline \end{array}$$

- $456 \times 1 = 456$

$$\begin{array}{r} 4\ 5\ 6 \\ \times\ \ 4\ 1 \\ \hline 4\ 5\ 6 \\ \cdot \\ \hline \end{array}$$

- $456 \times 4 = 1824$

$$\begin{array}{r} 4\ 5\ 6 \\ \times\ \ 4\ 1 \\ \hline 4\ 5\ 6 \\ 1\ 8\ 2\ 4\ \cdot \\ \hline \end{array}$$

- $456 + 18240 = 18720$

$$\begin{array}{r} 4\ 5\ 6 \\ \times\ \ 4\ 1 \\ \hline 4\ 5\ 6 \\ 1\ 8\ 2\ 4\ \cdot \\ \hline 1\ 8\ 6\ 9\ 6 \end{array}$$

Ex 40:

$$\begin{array}{r} 3\ 4\ 0 \\ \times\ \ 9\ 1 \\ \hline \\ \\ \hline \end{array}$$

$340 \times 91 = \boxed{30940}$

Answer:

-

$$\begin{array}{r} 3\,4\,0 \\ \times\quad 9\,1 \\ \hline \\ \hline \end{array}$$

- $340 \times 1 = 340$

$$\begin{array}{r} 3\,4\,0 \\ \times\quad 9\,1 \\ \hline 3\,4\,0 \\ \hline \end{array}$$

- $340 \times 9 = 3060$

$$\begin{array}{r} 3\,4\,0 \\ \times\quad 9\,1 \\ \hline 3\,4\,0 \\ 3\,0\,6\,0\,\cdot \\ \hline \end{array}$$

- $340 + 30600 = 30940$

$$\begin{array}{r} 3\,4\,0 \\ \times\quad 9\,1 \\ \hline 3\,4\,0 \\ 3\,0\,6\,0\,\cdot \\ \hline 3\,0\,9\,4\,0 \end{array}$$

Ex 41:

$$\begin{array}{r} 9\,2\,1 \\ \times\quad 7\,5 \\ \hline \\ \\ \hline \\ \\ \end{array}$$

$921 \times 75 = \boxed{69075}$

Answer:

-

$$\begin{array}{r} 9\,2\,1 \\ \times\quad 7\,5 \\ \hline \\ \hline \end{array}$$

- $921 \times 5 = 4605$

$$\begin{array}{r} 9\,2\,1 \\ \times\quad 7\,5 \\ \hline 4\,6\,0\,5 \\ \hline \end{array}$$

- $921 \times 7 = 64470$

$$\begin{array}{r} 9\,2\,1 \\ \times\quad 7\,5 \\ \hline 4\,6\,0\,5 \\ 6\,4\,4\,7\,\cdot \\ \hline \end{array}$$

- $4605 + 64470 = 69075$

$$\begin{array}{r} 9\,2\,1 \\ \times\quad 7\,5 \\ \hline 4\,6\,0\,5 \\ 6\,4\,4\,7\,\cdot \\ \hline 6\,9\,0\,7\,5 \end{array}$$