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9/25/25

Ch. 3. (X) by Tens

$$20 \times 58 = \underline{1,160} \downarrow$$

$$\uparrow \overset{\text{EST}}{1200}$$

	20	0	
50	50 × 20 1000	50 × 0 0	→ 1000
8	8 × 20 160	8 × 0 0	→ 160
			0
			+ 0
			<u>1160</u>

$$14 \times 30 = \underline{420} \uparrow \downarrow \text{EST: } \underline{300}$$

30×14

	10	4	
30	30 × 10 300	30 × 4 120	→ 300
0	0 × 10 0	0 × 4 0	→ 120
			420

$$70 \times 18 = \underline{1260} \downarrow \uparrow \text{EST: } \underline{1400}$$

	10	8			70	0
70	700	560	700	560	10	700
0	0	0	1260	560	8	560
						0

9/30/24

Ch. 3 (X) by Tens

$$20 \times 58 = \underline{1160}$$

$$20 \times (50 + 8)$$

	50	8	
	20 x 50	20 x 8	1000
20	1000	160	+ 160
			<u>1160</u>

$$14 \times 30 = \underline{420}$$

$$30 \times 14$$

	10	4	
	30 x 10	30 x 4	
30	300	120	420

	30	0	
10	10 x 30	0	300
	300		
4	4 x 30	0	<u>120</u>
	120		420

$$52 \times 96 = 4992$$

$$(50+2) \times (90+6)$$

	90	6	
50	50×90 4500	50×6 300	→
2	2×90 180	2×6 12	

$$\begin{array}{r}
 4500 \\
 300 \\
 180 \\
 + 12 \\
 \hline
 4992
 \end{array}$$

$$31 \times 25 = 775$$

	20	5	
30	30×20 600	30×5 150	→
1	1×20 20	1×5 5	

$$\begin{array}{r}
 600 \\
 150 \\
 20 \\
 + 5 \\
 \hline
 775
 \end{array}$$

$$30 \times 179 = 5370$$

	100	70	9	
30	30 x 100 3000	30 x 70 2100	30 x 9 270	→ 3000 2100
0	0	0	0	→ + 270 5370

$$\begin{array}{r}
 \textcircled{2} \textcircled{2} \\
 179 \\
 \times 30 \\
 \hline
 000 \\
 + 5370 \\
 \hline
 5370
 \end{array}$$

$$\begin{array}{l}
 0 \times 179 \\
 30 \times 179
 \end{array}$$

30

10/1/24 Ch. 3 Estimation

$$13 \times 23 \approx 200$$

$$\begin{array}{r} \uparrow \quad 13 \rightarrow 10 \\ \times 23 \rightarrow \times 20 \\ \hline 200 \end{array} \quad \downarrow$$

$$15 \times 99 \approx 2000$$

$$\begin{array}{r} \downarrow \quad 99 \rightarrow 100 \\ \times 15 \rightarrow \times 20 \\ \hline 2000 \end{array} \quad \uparrow \text{ about}$$

	10	5
90	900	450
9	90	45

$$\begin{array}{r} 1 \\ 900 \\ 450 \\ 90 \\ + 45 \\ \hline 1485 \end{array}$$

$$55 \times 91 \approx \underline{\hspace{2cm}}$$

$$\begin{array}{r} \downarrow 91 \rightarrow 90 \uparrow \\ \times 55 \rightarrow \times 60 \\ \hline 5005 \quad 5400 \end{array}$$

	90	1	
50	50 × 90 4500	50 × 1 50	$\begin{array}{r} 4500 \\ 450 \\ 50 \\ 5 \\ \hline 5005 \end{array}$
5	5 × 90 450	5 × 1 5	

$\text{---} + \text{---} + (\text{---}) 5005$

$$\begin{array}{r} \uparrow 5897 \rightarrow 6000 \uparrow \\ \times 72 \quad \times 70 \\ \hline 420000 \end{array}$$

$$12,498,621 \times 48,552,000$$

$$1,000,000,000 \times 5,000,000,000$$

$$5,000,000,000,000,000$$

10/2/24

Ch. 3 Multi-Digit
Area Model

$$13 \times 23 = \underline{299}$$

	10	3	
20	20×10 200	20×3 60	200 60
3	3×10 30	3×3 9	30 9
			+ 9
			<u>299</u>

P.P.

DP $\rightarrow (20 \times 10) + (20 \times 3) + (3 \times 10) + (3 \times 3)$

$$17 \times 36 = \underline{\quad}$$

	30	6	
①			
300	10×30 300	10×6 60	
210	7×30 210	7×6 42	
60			
+ 42			
<u>612</u>			

	10	7	
30	30×10 300	30×7 210	
6	6×10 60	6×7 42	

$$435 \times 25$$

	400	30	5	
20	20×400 8000	20×30 600	20×5 100	8000 2000 600 100
5	5×400 2000	5×30 150	5×5 25	2000 150 25
				+ 25

10875

34

10/7/24 Ch. 3 Partial Products

$$\textcircled{32} \times 193$$

	100	90	3
30	30×100 3000	30×90 2700	30×3 90
2	2×100 ✓ 200	2×90 ✓ 180	2×3 ✓ 6 ✓

$$193$$

$$\times 32$$

$$\begin{array}{r} 180 \\ 200 \\ 90 \\ 2700 \\ + 3000 \\ \hline 5676 \end{array}$$

p.p.

$$D.P. (30 \times 100) + (30 \times 90) + (30 \times 3) + (2 \times 100) + (2 \times 90) + (2 \times 3)$$

$$(30+2) \times (100+90+3)$$

$$\underline{32 \times 193}$$

$$\underline{46 \times 98} =$$

pp

	90	8
40	3600	320
6	540	48

$$3600, 540, 320, 48$$

$$45 \times 209$$

$$200 \quad 0 \quad 9$$

40	8000	0	360
5	1000	0	45

$$\begin{array}{r}
 8000 \\
 1000 \\
 360 \\
 + 45 \\
 \hline
 9405
 \end{array}$$

$$333 \times 696$$

$$600 \quad 90 \quad 6$$

300	180000 ✓	27000 ✓	1800 ✓
30	18000 ✓	2700 ✓	180 ✓
3	1800 ✓	270 ✓	18

$$\begin{array}{r}
 180000 \\
 27000 \\
 18000 \\
 2700 \\
 1800 \\
 270 \\
 180 \\
 18 \\
 \hline
 231768
 \end{array}$$

36

10/8/24

Ch. 3 2 Digit

"Old-School"

$$\begin{array}{r} \text{21} \\ \times 13 \\ \hline 63 \\ + 210 \\ \hline 273 \end{array}$$

$$13 \times 21 =$$

	20	1	
10	200	10	210
3	60	3	63

$$\begin{array}{r} \textcircled{3} \\ 15 \\ \times 17 \\ \hline 105 \\ + 150 \\ \hline 255 \end{array}$$

$$\begin{array}{r} \textcircled{3} 15 \\ \times 7 \\ \hline 105 \end{array} \quad \begin{array}{r} 15 \\ \times 10 \\ \hline 150 \end{array}$$

$$\begin{array}{r} \textcircled{2} \\ 26 \\ \times 48 \\ \hline 208 \\ + 1040 \\ \hline 1248 \end{array} \quad \begin{array}{r} \rightarrow 30 \uparrow \\ \times 50 \\ \hline 1500 \end{array}$$

$$\begin{array}{r}
 \textcircled{2} \\
 47 \\
 \times 13 \\
 \hline
 141 \\
 + 470 \\
 \hline
 611
 \end{array}$$

Est
500

$$\begin{array}{r}
 461 \\
 \times 22 \\
 \hline
 922 \\
 + 9220 \\
 \hline
 10142
 \end{array}$$

500
20
10000

$$\begin{array}{r}
 \textcircled{1} \textcircled{6} \\
 219 \\
 \times 27 \\
 \hline
 1533 \\
 + 4380 \\
 \hline
 5913
 \end{array}$$

→ 200

→ × 30

6000

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10/9/24 Ch. 3 Mixed Review

$$49 \times 53$$

	50	3
40	2000	120
9	450	27

$$2000$$

$$450$$

$$120$$

$$+ 27$$

$$\hline 2597$$

$$497 \times 28$$

$$500 \times 30 = 15000$$

	400	90	7
20	8000	1800	140
8	3200	720	56

$$\textcircled{00}$$

$$8000$$

$$3200$$

$$1800$$

$$720$$

$$140$$

$$+ 56$$

$$\hline 13916$$

$$\begin{array}{r}
 \textcircled{1} \\
 \textcircled{3} \textcircled{4} \\
 473 \\
 \times \textcircled{25} \\
 \hline
 2365 \\
 + 9460 \downarrow \\
 \hline
 11,825
 \end{array}$$

$$500 \times 30 = 15000$$

$$393 \times 38$$

	300	90	3
30	9000	2700	90
8	2400	720	24

$$\begin{array}{r}
 \textcircled{2} \\
 \textcircled{1} \textcircled{4} \\
 393 \\
 \times \textcircled{38} \\
 \hline
 3144 \\
 + 11790 \downarrow \\
 \hline
 14,934
 \end{array}$$

$$\begin{array}{r}
 \textcircled{1} \textcircled{1} \\
 9000 \\
 2700 \\
 2400 \\
 720 \\
 90 \\
 + 24 \\
 \hline
 14,934
 \end{array}$$

	40	1
30	1200	30
6	240	6

1200
240
30
6

$$\underline{36} \times \underline{41} = \underline{1476}$$

	90	6
20	1800	120
4	360	24

1800
360
120
24

$$\underline{96} \times \underline{24} = \underline{2304}$$

24 x 96

	300	60	8
40	12000	2400	320
35	1500	300	40

$$\underline{45} \times \underline{368} = \underline{16560}$$

368 x 45