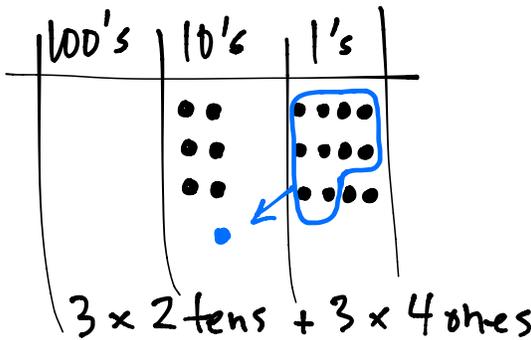


Name \_\_\_\_\_

Date \_\_\_\_\_

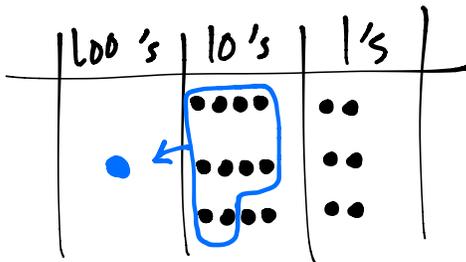
1. Represent the following expressions with disks, regrouping as necessary, writing a matching expression, and recording the partial products vertically.

a.  $3 \times 24$



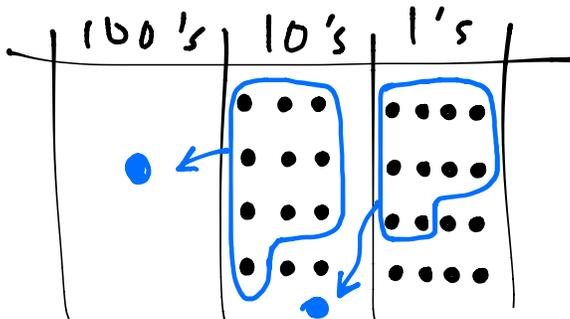
$$\begin{array}{r} 24 \\ \times 3 \\ \hline 12 \\ + 60 \\ \hline 72 \end{array}$$

b.  $3 \times 42$



$$\begin{array}{r} 42 \\ \times 3 \\ \hline 6 \\ + 120 \\ \hline 126 \end{array}$$

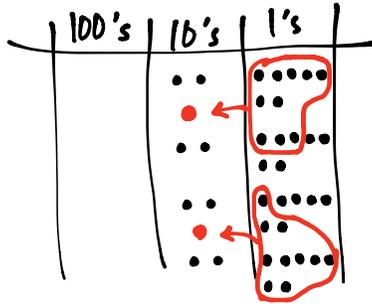
c.  $4 \times 34$



$$\begin{array}{r} 34 \\ \times 4 \\ \hline 16 \\ + 120 \\ \hline 136 \end{array}$$

2. Represent the following expressions with disks, regrouping as necessary. To the right, record the partial products vertically.

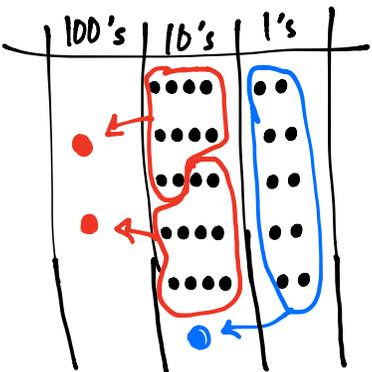
a.  $4 \times 27$



$$\begin{aligned} &4 \times 2 \text{ tens} + 4 \times 7 \text{ ones} \\ &8 \text{ tens} + 28 \text{ ones} \\ &10 \text{ tens} + 8 \text{ ones} \end{aligned}$$

$$\begin{array}{r} 27 \\ \times 4 \\ \hline 28 \quad (4 \times 7 \text{ ones}) \\ + 80 \quad (4 \times 2 \text{ tens}) \\ \hline 108 \end{array}$$

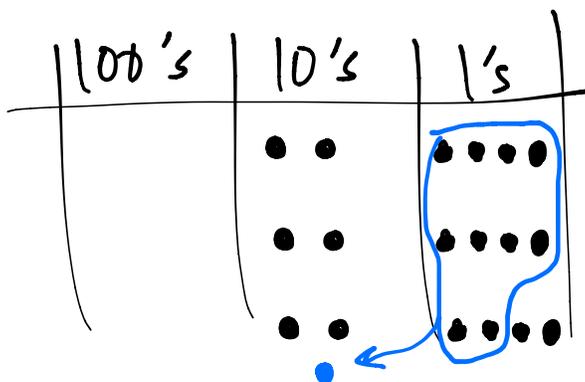
b.  $5 \times 42$



$$\begin{aligned} &5 \times 4 \text{ tens} + 5 \times 2 \text{ ones} \\ &20 \text{ tens} + 10 \text{ ones} \\ &21 \text{ tens} \end{aligned}$$

$$\begin{array}{r} 42 \\ \times 5 \\ \hline 10 \quad (5 \times 2 \text{ ones}) \\ + 200 \quad (5 \times 4 \text{ tens}) \\ \hline 210 \end{array}$$

3. Cindy says she found a shortcut for doing multiplication problems. When she multiplies  $3 \times 24$ , she says, “ $3 \times 4$  is 12 ones, or 1 ten and 2 ones. Then there’s just 2 tens left in 24, so add it up and you get 3 tens and 2 ones.” Do you think Cindy’s shortcut works? Explain your thinking in words and justify your response using a model or partial products.



$$\begin{array}{r} 24 \\ \times 3 \\ \hline 12 \quad (3 \times 4 \text{ ones}) \\ + 60 \quad (3 \times 2 \text{ tens}) \\ \hline 72 \end{array}$$

Cindy forgot to multiply 2 tens by 3.