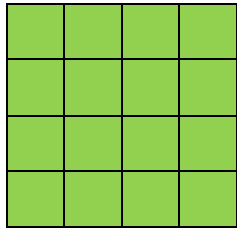**Partial Answers to 1.4 Homework**

3. $78 = 3$ flats (each worth 25) + no rods + 3 units = $\textbf{303}_5$

5. a.
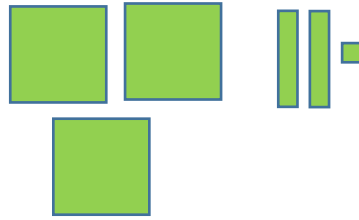

Flats = 16   rods = 4   units = 1

5b. $321_4 =$

$= 57$

6. Since 234_5 is *in* base 5, we place the number into the base 5 columns:

5^2 25's	5^1 5's	5^0 1's
2	3	4
2×25	3×5	4×1

$= 2×25 + 5×3 + 4×1 = 50+15+4 = \textbf{69}$. (The number 69 is in base 10.)
We can also picture this as 2 base-5 flats, 3 rods and 4 units.

7. Since 71 is *not in* base 5, we do *not* place 71 into the base 5 columns. Instead, we try to figure out how many flats, or 25's, we will need to make 71, then how many rods and units we will need.

5^2 25's	5^1 5's	5^0 1's
?	?	?

$= 71$

$71÷25 = 2.84$, so we will need 2 flats. Place the 2 flats into the table.
$2×25 = 50$ so we will have $71 - 50 = 21$ left.

To make 21, we will need 4 rods (since rods are each worth 5, and $4 × 5 = 20$) and 1 unit.

5^2 25's	5^1 5's	5^0 1's
2	4	1
2×25	4×5	1×1

So 71 (in base 10) = $\textbf{241}_5$ (in base 5)

We can also picture this as 2 base-5 flats, 4 rods and 1 unit.

8.
a. $91 = 231_6$.
b. $143_7 = 80$.
c. $10111_2 = 23$.

d. $51 = 110011_2$
e. $4E8_{12} = 716$
f. $50 = 101_7$