Sign of the Times

You need: a calculator

1. Continue the following patterns for the next five equations down.
   Describe what the patterns have in common.

   a.
   3 x 5 = ☐
   3 x 4 = ☐
   3 x 3 = ☐
   3 x 2 = ☐
   3 x 1 = ☐
   ⋮

   b.
   4 x 7 = ☐
   3 x 7 = ☐
   2 x 7 = ☐
   1 x 7 = ☐
   0 x 7 = ☐
   ⋮

   c.
   $3 \times {}^-2 = {}^-6$
   $2 \times {}^-2 = {}^-4$
   $1 \times {}^-2 = {}^-2$
   $0 \times {}^-2 =$ ☐
   ${}^-1 \times {}^-2 =$ ☐
   ⋮

2. Toline used negative buttons to explain the next three equations in pattern **1a**.

Well, three times zero has got to be zero.

Three times negative one must be negative three.

Three times negative two must be negative six.

   a. Draw negative-button pictures to explain the next three equations in pattern **1b**.

   b. Can ${}^-1 \times {}^-2 =$ ☐ be shown with negative buttons? Why or why not?

1. Use patterns to complete the numbers in this multiplication array.

x	⁻3	⁻2	⁻1	0	1	2	3
3	⁻9			0	3	6	9
2				0		4	
1				0	1	2	
0				0	0	0	0
⁻1							
⁻2							
⁻3	9						

Note:
⁺2 is the same as 2,
⁺5 is the same as 5,
and so on.

2. What rules can you find for multiplying negative numbers?