#### Section One

- 1 × -1 means 1 lot of –1. What is 1 lot of –1?

2 × -1 means 2 lots of –1. What is 2 × -1?

Work out the following: 3 × -1, 4 × -1, 5 × -1.

- Illustrate your answers on a pair of (spaced-out) number lines, marked from –5 to 5. What do you notice about the pattern formed? Use your observation to complete the pattern and find the answers to: 0 × -1, -1 × -1, -2 × -1, -3 × -1, -4 × -1, -5 × -1.

- Suggest a rule for each of the following:

1. Multiplying a positive number by a negative number
2. Multiplying a negative number by a negative number

- Test your rules by using a calculator to work out any calculations of your choosing. Write down every one that you try. Do your rules work?

[*NB: Negative numbers are put into calculators in one of two ways;*

* *-3 might be written by pressing ‘3’ followed by the ‘+/–’ key,*
* *or it might be written by pressing the (-) button followed by ‘3’.*

*Make sure you know how your calculator works!*]

#### Section Two

* ‘6 ÷ 2’ means ‘how many 2’s are there in 6?’ What does –1 ÷ -1 mean?

Write this out in words and suggest the answer.

By considering the meaning of, ‘divided by’, answer the following:

-2 ÷ -1, -3 ÷ -1, -4 ÷ -1, -5 ÷ -1.

* Show the solutions on parallel number lines as in the previous task.

By completing the pattern, find a rule for:

1. Dividing a positive number by a negative number
2. Dividing a negative number by a negative number

- Find the answers to the following without the use of a calculator:

❶ -3 × 2 ❹ -12 ÷ 6

❷ -4 × -5 ❺ 8 × -3

❸ -16 ÷ -4 ❻ 14 ÷ -7

#### Extension

Are there any similarities between your two sets of rules? Rewrite your rules so that just two statements cover the four possibilities of multiplication and division. Test them by using a calculator to try some problems of your own. Show your working.

Find the answers to these: -1 × -2 × -3 × 4, -1 × 2 × -3 × -4, -1 × -2 × -3 × -4, -22, (-2)2