

- 11 a Write each of these numbers as a product of prime numbers.
 i 15 ii 15^2 iii 28
 iv 28^2 v 36 vi 36^2
- b What do you notice about your answers to i and ii, iii and iv, v and vi?
- c If $96 = 2^5 \times 3$, show how to find the prime factors of 96^2 . Will your method work for all numbers?
- 12 $40 = 2 \times 2 \times 2 \times 5$ and $28 = 2 \times 2 \times 7$
 Use these facts to find
 a the HCF of 40 and 28 b the LCM of 40 and 28.
- 13 $450 = 2 \times 3 \times 3 \times 5 \times 5$ and $60 = 2 \times 2 \times 3 \times 5$
 Use these facts to find
 a the HCF of 450 and 60 b the LCM of 450 and 60.
- 14 $180 = 2^2 \times 3^2 \times 5$ and $54 = 2 \times 3^3$
 Use these facts to find
 a the HCF of 180 and 54 b the LCM of 180 and 54.
- 15 a Write 45 as a product of prime numbers.
 b Write 75 as a product of prime numbers.
 c Find the LCM of 45 and 75.
 d Find the HCF of 45 and 75.
- 16 a Draw factor trees to find the LCM of 90 and 140.
 b Compare your answer with a partner's. Did you draw the same factor trees? Have you both got the same answer?
- 17 a Write 396 as a product of prime numbers.
 b Write 168 as a product of prime numbers.
 c Find the HCF of 396 and 168.
 d Find the LCM of 396 and 168.
- 18 a Find the HCF of 34 and 58.
 b Find the LCM of 34 and 58.
- 19 Show that the HCF of 63 and 110 is 1.
- 20 37 and 47 are prime numbers.
 a What is the HCF of 37 and 47?
 b What is the LCM of 37 and 47?
 c Write a rule for finding the HCF and LCM of two prime numbers.
 d Compare your answer to part c with a partner's answer. Check your rules by finding the HCF and LCM of 39 and 83.

Tip

Use a calculator to help you.

Continued

- c Here is the start of another sequence of multiplications.
 $-5 \times 4 =$
 $-5 \times 3 =$
 $-5 \times 2 =$
 Copy the sequence and write six more terms.
 Describe any patterns in the sequence.
- d In the sequences in a and c, you have some products of two negative integers. What can you say about the product of two negative integers?
- e Make up a sequence of your own like the ones in a and c.
- f Share your answers to parts d and e with a partner. Are your partner's sequences correct?

2 Work out these multiplications.

a 5×-2 b -5×2 c -5×-2 d -2×-5

3 Work out these multiplications.

a -6×-4 b -7×-7 c -10×-6 d -8×-11

4 Copy and complete this multiplication table.

$\times$	-5	3	-8
4			
-3		-9	
-6	30		

5 Work out:

a $(3 + 5) \times -4$ b $(-3 + -5) \times -6$
 c $-4 \times (5 - 8)$ d $-6 \times (-2 - -7)$

6 Round these numbers to the nearest whole number to estimate the answer.

a 3.9×-6.8 b -11.2×2.95
 c $(-6.1)^2$ d $(-4.88)^2$



7 Put these multiplications into groups based on the answers.

3×-4 -6×-2 12×1
 -4×-3 2×-6 -12×-1

- b Find one more product to put in each group.

Tip

Do the calculation in **brackets** first.

8 These are multiplication pyramids.

a



b



c



Each number is the product of the two numbers below it. For example, in a, $2 \times -4 = -8$.

Copy and complete the multiplication pyramids.



9

- a Draw a multiplication pyramid like those in Question 8, with the integers -2 , 3 and -5 in the bottom row, in that order. Complete your pyramid.



If you change the order of the bottom numbers, the number at the top of the pyramid is the same.

- b Is Zara correct? Test her idea by changing the order of the numbers in the bottom row of your pyramid.

10 Find the missing numbers in these multiplications.

a $-3 \times \square = -12$

b $-5 \times \square = 45$

c $\square \times -6 = 24$

d $\square \times -10 = 80$

Think like a mathematician

- 11 A multiplication can be written as a division.
For example, $5 \times 8 = 40$ can be written as $40 \div 8 = 5$ or $40 \div 5 = 8$.
- a Here is a multiplication: $-4 \times 6 = -24$.
Write it as a division in two different ways.
- b Write a multiplication of a positive integer and a negative integer.
Then write it as a division in two different ways.
- c Here is a multiplication: $-7 \times -2 = 14$.
Write it as a division in two different ways.
- d Write a multiplication of two negative integers.
Then write it as a division in two different ways.

Tip

A conjecture is a possible value based on what you know.



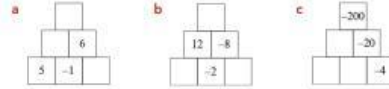
Continued

- e Can you make a **conjecture** about the answer when you divide an integer by a negative integer? Test your conjecture.
- f Compare your answer with a partner's answers. Have you made the same conjectures?

12 Work out these divisions.

- a $18 \div -6$ b $-28 \div -4$ c $30 \div -6$
 d $-30 \div -10$ e $42 \div -6$ f $-24 \div -4$
 g $60 \div -5$ h $-25 \div -5$

13 Here are three multiplication pyramids.



Copy and complete each pyramid.

14 Work out

- a $(3 \times -4) \div -2$ b $(2 - 20) \div -3$
 c $(-3 + 15) \div -4$ d $24 \div (2 \times -4)$

15 Find the value of x .

- a $x \div -4 = 8$ b $x \div -3 = -15$
 c $16 \div x = -2$ d $-15 \div x = 3$

16 Round these numbers to the nearest whole number to estimate the answer.

- a $-8.75 \div 2.8$ b $18.1 \div -5.9$
 c $-28.2 \div -3.8$ d $-35.2 \div -6.9$

17 Round these numbers to the nearest 10 to estimate the answer.

- a -48×-29 b -18.1×61.5
 c $-71.4 \div -11.8$ d $-99.4 \div 19$

Tip

Remember, division is the **inverse** of multiplication so you will divide as you work down the pyramid.

Summary checklist

- ☐ I can multiply two negative integers.
☐ I can divide any integer by a negative integer.

