Integers

- **Multiplying and dividing integers**

explanation 1a | explanation 1b

1 Work these out.

a $4 - 8$ 　　 b $-9 + 23$ 　　 c $26 - 32$ 　　 d $-18 + 36$

e $14 + 17 - 20$ 　　 f $-22 - 13 + 16$ 　　 g $-12 + 15 + 26$ 　　 h $-32 - 8 + 15$

2 Copy and complete these.

a $5 + -2 = 5 \square 2 = \square$ 　　　　 b $-3 - -7 = -3 \square 7 = \square$

c $0 - -9 = 0 \square 9 = \square$ 　　　　 d $-11 + -12 - -6 = -11 \square 12 \square 6 = \square$

e $5 + -13 - -7 = 5 \square 13 \square 7 = \square$

f $14 - -24 + -18 = 14 \square 24 \square 18 = \square$

3 Work these out.

a $10 - -15$ 　　　　 b $-20 - 12$ 　　　　 c $40 + -15$

d $-30 + -10$ 　　　　 e $-20 - -15 + 4$ 　　　　 f $18 - -22 + -30$

g $-22 + -4 - -8$ 　　　 h $-26 - -10 + 5$ 　　　 i $-2 + (+5)$

j $-10 + (-3)$ 　　　　 k $1 - (+9) - (-5)$ 　　　 l $-100 - (-8) - 4$

4 Copy and complete the table.

x	18	7	11	3	−4	−7	−12		1	8	−10	−6
y	13	12	−2		−6		−5	−9	−1			4
$x - y$				1		0		4		−2		
$x + y$											−3	

explanation 2

5 Copy and complete these multiplication tables.

a **i** $3 \times 3 = 9$ **ii** $3 \times -3 = -9$

$2 \times 3 = \square$ $2 \times -3 = \square$

$1 \times 3 = 3$ $1 \times -3 = -3$

$0 \times 3 = 0$ $0 \times -3 = \square$

$-1 \times 3 = -3$ $-1 \times -3 = \square$

$-2 \times 3 = \square$ $-2 \times -3 = 6$

$-3 \times 3 = -9$ $-3 \times -3 = \square$

b Describe the pattern in the answer columns.

c What do you notice about the answer when a negative number and a positive number are multiplied together?

d What can you say about the answer when two negative numbers are multiplied together?

6 Work these out.

a 2×-6 **b** -7×-4 **c** -3×7 **d** 9×-8

e 5×-12 **f** -8×15 **g** -10×-23 **h** -6×20

i -16×-4 **j** -100×32 **k** 50×-14 **l** -25×-5

m $(-4)^2$ **n** $(-1)^2$ **o** $(-7)^2$ **p** $2 \times (-5)^2$

7 Copy and complete this multiplication grid.

×	−2		3	−7
		20		
−9		−45		
			−9	
				−42

8 List all the pairs of integers you can multiply together to give each number.

a −6   **b** 18   **c** −9

9

| 8 | | −20 | | −15 | | 24 | | −20 | | −4 |

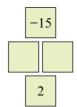| −4 | −2 | | 2 | −10 | | | | | | | | | | | |

| −6 | | −8 | | 2 | | −11 | | 1 | | 0 |

   a What is the link between the two middle numbers and the top number?

   b What is the link between the two middle numbers and the bottom number?

   c Copy and complete the last four diagrams.

> **explanation 3**

10 a How many times does −3 fit into −12?

    b How many times does −7 fit into −63?

11 Work these out.

   a $45 \div -5$ **b** $-36 \div -4$ **c** $-20 \div 2$ **d** $-30 \div 6$

   e $56 \div -7$ **f** $72 \div -8$ **g** $-60 \div 4$ **h** $-96 \div -12$

   i $-120 \div -8$ **j** $64 \div -8$ **k** $-48 \div -3$ **l** $100 \div -25$

12 Using multiplication or division with positive and negative numbers, write four calculations for each of these answers.

   a −16   **b** 32   **c** −42   **d** −60

13 Copy and complete the table.

x	36	−84	−48		72	−65		−17
y	−9	12		−8	−2		13	
$x \div y$			−6	−8		5	−3	−17

14 Work these out.

   a $-3 \times -8 \div 4$ **b** $36 \div -9 \times -2$ **c** $-70 \div -7 \times -4.5$

   d $16 \times -4 \div -8$ **e** $12 \div -6 \times -7$ **f** $-121 \div 11 \times -7$
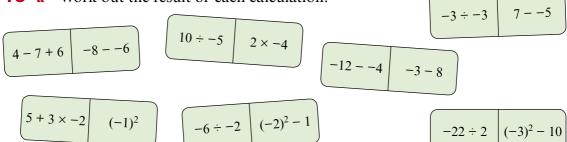
   g $9 \times 7 \div -3$ **h** $-150 \times -2 \div -30$ **i** $25 \times -12 \div 6$

15 a Work out the result of each calculation.

| $4 - 7 + 6$ | $-8 - -6$ |

| $10 \div -5$ | 2×-4 |

| $-3 \div -3$ | $7 - -5$ |

| $-12 - -4$ | $-3 - 8$ |

| $5 + 3 \times -2$ | $(-1)^2$ |

| $-6 \div -2$ | $(-2)^2 - 1$ |

| $-22 \div 2$ | $(-3)^2 - 10$ |

b Arrange the dominos so that ends with the same answer are joined, starting with the double. What is the answer to the part of the last domino that is not joined to another one?

16 Copy and complete the table.

x	-8	-12	7	9	-7	15	-3	-0.5	10	-8
y	-2									
$x + y$										
$x - y$				3						
$x \times y$			-14					1		32
$x \div y$		3		-4.5		-3	0.5		-0.1	

17 a Paula is trying to solve this equation.

$$x^2 - x - 12 = 0$$

The teacher says there are two solutions.

i Paula tries $x = -5$ first. Explain why this is not a solution to the equation.

ii Find the two solutions.

b Use a similar method to find the two solutions to these equations.

i $x^2 + 6x + 5 = 0$

ii $x^2 + x - 6 = 0$

> Hint: Try the numbers
> $$-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5$$
> to solve $x^2 - x - 12 = 0$.
> Try $x = -5$:
> $$x^2 - x - 12 = (-5)^2 - -5 - 12$$
> $$= 25 + 5 - 12$$
> $$= 18$$