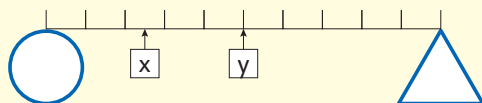




1. Find the values of  $x$  and  $y$  if:



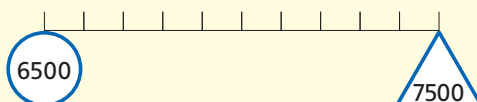
- a)  $\bigcirc$  is zero and  $\triangle$  is 2000
- b)  $\bigcirc$  is 4000 and  $\triangle$  is 5000
- c)  $\bigcirc$  is 5600 and  $\triangle$  is 5700
- d)  $\bigcirc$  is 9250 and  $\triangle$  is 9270.

Were some parts easier to do than others?  
Can you explain why?

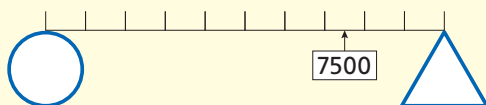


2. Here  $\bigcirc$  is 6500 and  $\triangle$  is 7500.

Using only these cards below, what 4-digit numbers can you make that can be placed on this number line?



3. 7500 is marked on this line.



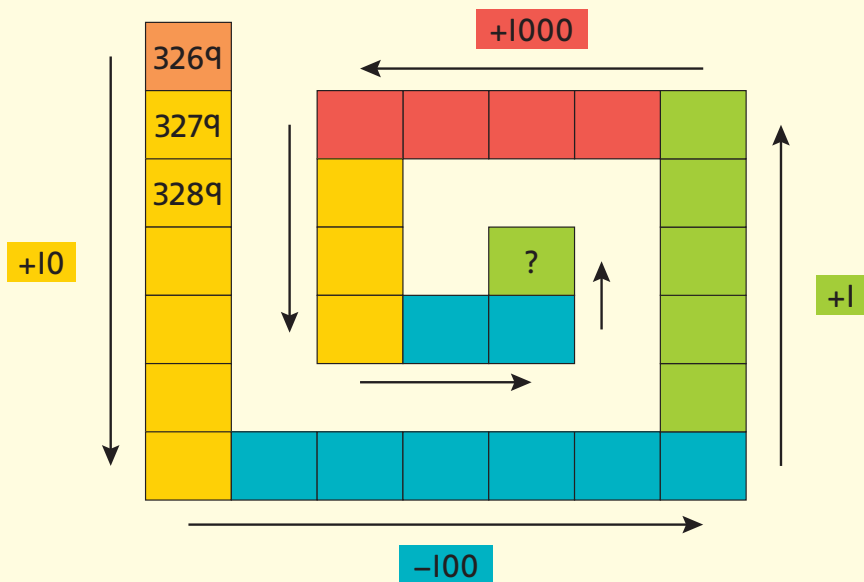
What could  $\bigcirc$  and  $\triangle$  be?

Find three different answers.

# 15 Spirals

Y4: Solve number problems involving place value

- T** 1. As you move around the spiral, following the arrows, add or subtract the amount shown. Start with 3269. What will the central number be?



- S** 2. Start with a larger 4-digit number and find what the central number will be.

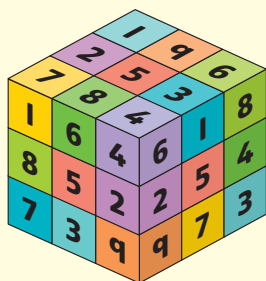
How many more than the start number is the central number?

Is it always the same? Can you explain why?

- D** 3. If the central number is 9300, what must the start number be? Explain how you can work this out easily.

# 23 Cube calculations

Y4: Estimate and use inverse operations



On this cube, you can read 3-digit numbers across or down.



- T** 1. Find a pair of numbers from the cube with a total that is a multiple of 10.

How many pairs can you find?

Explain what you looked for.

- S** 2. Now find a pair of numbers from the cube with a total that is:

a) greater than 1900.

b) exactly 1000.

c) a different multiple of 100.

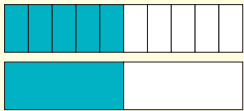
- D** 3. Find pairs of numbers from the cube with these totals.

a)  $250 < \square < 300$     b)  $1820 < \square < 1830$

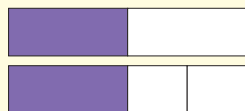
Explain what strategies you used to find the solutions.

# 36 Fraction strips

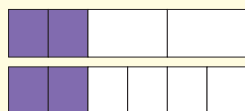
Y4: Recognise families of common equivalent fractions

- T** 1. How do these bars show another fraction equivalent to one half?
- 
- S** 2. Each statement below is **false**. What is wrong with each statement and diagram?

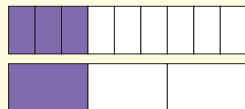
a) These bars prove that  $\frac{1}{2}$  and  $\frac{1}{3}$  are equivalent.



b) These bars prove that  $\frac{2}{4}$  and  $\frac{2}{6}$  are equivalent.

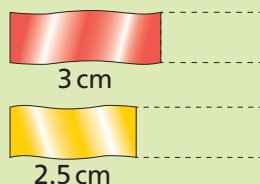


c) These bars prove that  $\frac{3}{6}$  and  $\frac{1}{3}$  are equivalent.



Two strips of ribbon are different lengths. A fraction of each is cut off.

This picture shows  $\frac{1}{4}$  of the red ribbon and  $\frac{1}{5}$  of the yellow ribbon.



3. Which ribbon was longer before they were cut? Explain your answer.

## 15 Spirals

**Number – Number and place value**

*Solve number problems involving place value (e.g. count on and back in 1s, 10s, 100s and 1000s)*

- T** 1. 6565
- S** 2. 3296. The difference between the start number and the central number will always be the same as you are adding and subtracting the same values, e.g. +1000 (four times) +10 (nine times), +1 (six times) and -100 (eight times).
- D** 3. 6004. Subtract 3296 from 9300. This can most easily be done by subtracting 3300 and then adding 4.

### Key questions

“What would the central number be if you started with a number less than 3269?”  
“What if you changed each operation to its inverse, from + 10 to - 10 and so on?”  
“What is the smallest starting number that would give a positive answer?”

## 16 Roman hundred square

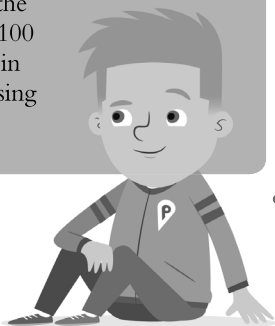
**Number – Number and place value**

*Read Roman numerals to 100*

- T** 1. XXI, XXII, XXIII, XXIV, XXV, XXVI, XXVII, XXVIII, XXIX, XXX
- S** 2. XXIX = 29, XLIX = 49, LVII = 57, LXXVI = 76
- D** 3. LXXXVIII uses 13 straight lines.
- 4. Numbers from 90 to 100 all contain a ‘C’.

### Key questions

“Can you think of the first number above 100 that can be written in Roman numerals using only straight lines?  
What will it be?”



## 17 Roman riddles

**Number – Number and place value**

*Read Roman numerals to 100*

- T** 1. Answers will vary but each should be a correct addition with the total of L (50), e.g. XXXVI + XIV = L.

### Key questions

“Which Roman numerals round to L to the nearest 10?”

- S** 2. Many different additions can be made but these only have four totals, LXIV (64) XLIV (44), LXVI (66) and XLVI (46).
- D** 3. Because ordinary numbers use place value (where the position of the digit determines its value) each digit can stand for a different number, e.g. 3 can mean 3000, 300, 30 or 3. Thus many more totals are possible than when using Roman numerals.

### Key questions

“How many different totals are possible when making additions with the digits 3, 4, 5 and 6?”

## 18 Bar model calculations

**Number – Addition and subtraction**

*Add and subtract numbers with up to four digits*

- T** 1.  $280 + 250 = 530$ ;  $250 + 280 = 530$ ;  $530 - 280 = 250$ ;  $530 - 250 = 280$
- S** 2. In any order:  $6600 + 2060 = 8660$ ,  $2060 + 6600 = 8660$ ;  $8660 - 6600 = 2060$ ,  $8660 - 2060 = 6600$
- 3. a) 5060 b) 960 c) 3798

### Key questions

“Can you explain what you did to find the missing number? Did you use a mental or written method?”

- D** 4. a) 0 because the ones digits of the others, 9 and 1 already add to make the ones digit zero in the total 8660.



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