

Escape the Room

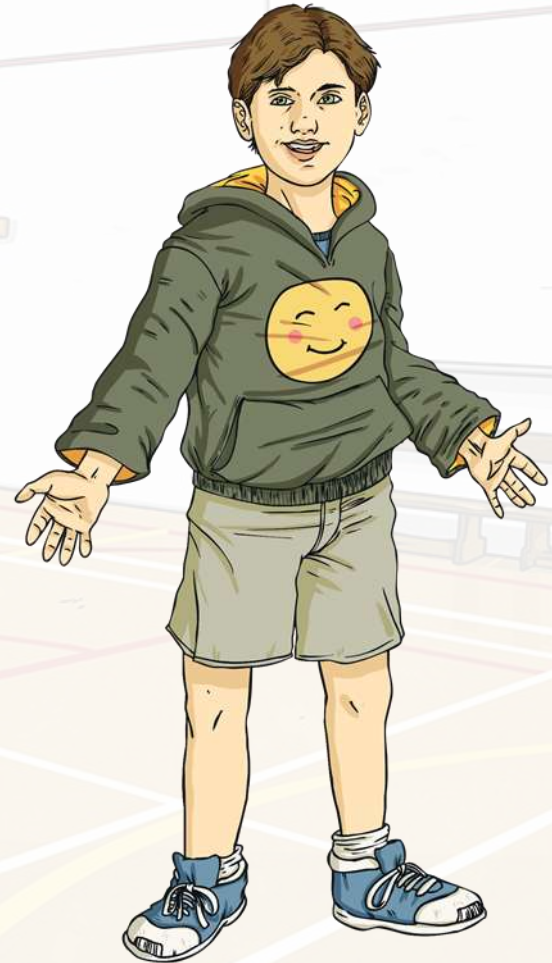
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Escape the Room!

You have been helping your teacher to tidy up the sports equipment after a P.E. lesson. You hear a loud bang and turn around to find that you have been accidentally locked in the school hall!

Solve the clues and puzzles hidden around the room and reveal the keypad code needed to open the door.

The clues could be anywhere so you need to keep your eyes peeled and your mind sharp! Good luck!



The Rules

- You can work in small groups.
- When you find a clue that has been hidden, work together to find the answer and reveal one of the digits to the keypad code.
- Record your answer on the answer sheet.
- Once you have discovered the ten-digit code for the keypad, check it with your teacher and find out if you can escape the room!

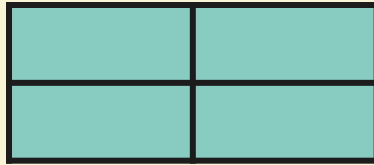


Reveal the Answers

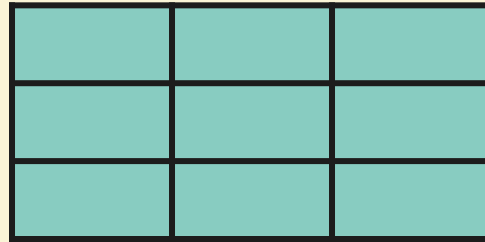


Clue for Digit 1

There are 9 rectangles (including squares) in this 2×2 grid.



How many rectangles (including squares) are there in this 3×3 grid?



Add together the digits of the answer to give you the first digit of the keypad code.

36 rectangles (including squares)

$$3 + 6 = 9$$

Clue for Digit 2

Discover the smallest square number that can be written using five **different** Roman numerals.

Divide this number by 24 to discover the second digit of the keypad code.

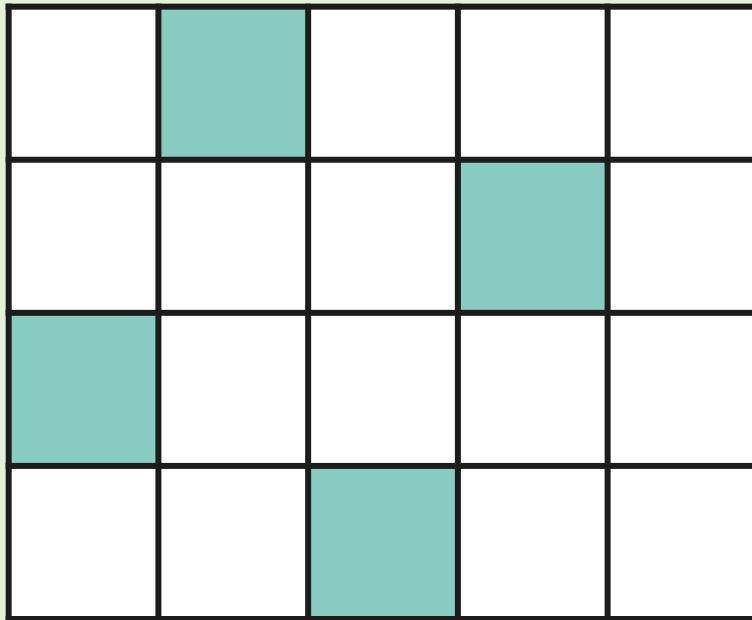
$$\text{CXLIV} = 144$$

$$144 \div 24 = \mathbf{6}$$

| Roman Numerals | Value |
|----------------|-------|
| I | 1 |
| V | 5 |
| X | 10 |
| L | 50 |
| C | 100 |
| D | 500 |
| M | 1000 |

Clue for Digit 3

How many more squares need to be shaded in so that $\frac{3}{4}$ of the grid is shaded?



Add together the digits of this answer to give you the third digit of the keypad code.

The grid is split into 20 equal parts altogether.

$$\frac{3}{4} \text{ of } 20 = 15$$

4 parts are already shaded, which means that 11 more need to be shaded to total 15.

$$1 + 1 = \mathbf{2}$$

Clue for Digit 4

Use the clues to calculate the mystery number.

- **Rounded to the nearest ten, the number is 61 460.**
- **The number is divisible by 4.**
- **The digit sum is even.**

What is the number?

Add together the digits of the mystery number to give you the fourth digit of the keypad code.

$$61\ 456$$

$$6 + 1 + 4 + 5 + 6 = 22$$

$$2 + 2 = 4$$

| | | |
|--|--|--|
| 61 460 | Possible numbers which round to the nearest ten: | 61 455, 61 456, 61 457, 61 458, 61 459, 61 460, 61 461, 61 462, 61 463, 61 464 |
| Which of these numbers are divisible by 4? | | 61 456, 61 460, 61 464 |
| Which of these numbers have an even digit sum? | | 61 456 |

Clue for Digit 5

Here is a line graph showing the length of a shadow measured over time.

At its shortest length, the shadow measured 40cm.

At its longest length, the shadow measured 240cm.

What was the length of the shadow at hour 7?

The tens digit of this answer will give you the fifth digit of the keypad code.

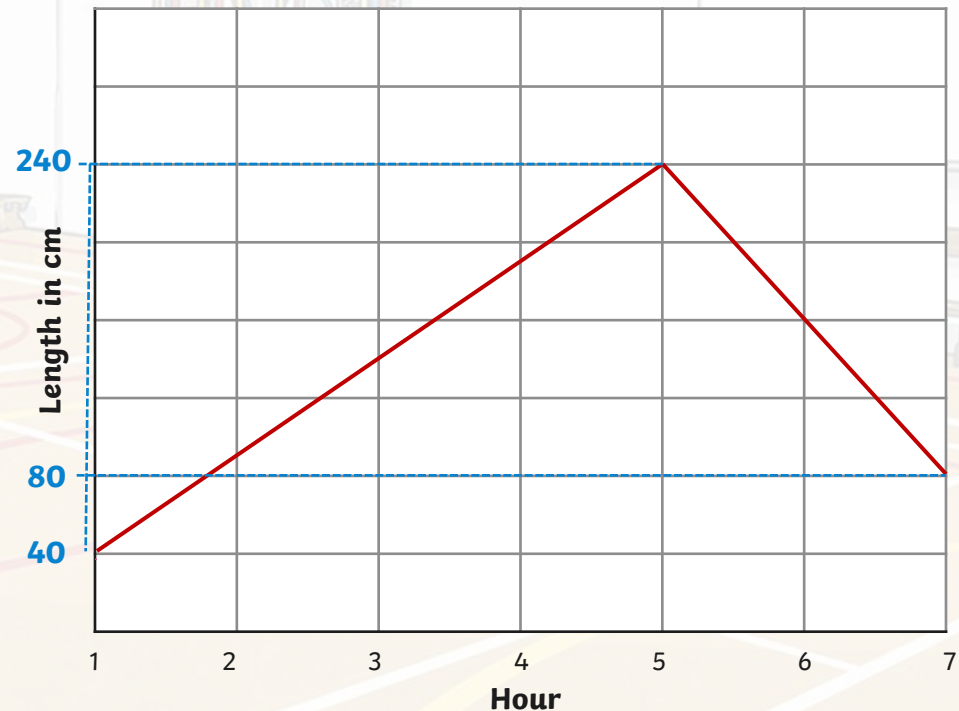
$$240 - 40 = 200$$

$$200 \div 5 = 40$$

$$40 + 40 = 80\text{cm}$$

The tens digit is **8**.

A Line Graph to Show the Length of a Shadow Measured over Time



Clue for Digit 6

Work out the rule for each number sequence and find the next five numbers in each sequence.

| | | | | | | | |
|----|------|------|------|------|------|-------------|-------------|
| 1. | 1250 | 1350 | 1450 | 1550 | 1650 | 1750 | 1850 |
| 2. | 6750 | 5750 | 4750 | 3750 | 2750 | 1750 | 750 |
| 3. | 1810 | 1800 | 1790 | 1780 | 1770 | 1760 | 1750 |

Which number is common to each of the number sequences?

Add together the digits of this answer to give you the sixth digit of the keypad code.

1750

$$1 + 7 + 5 + 0 = 13$$

$$1 + 3 = \mathbf{4}$$

Clue for Digit 7

Use the clues to calculate the mystery two-digit number that is less than 50.

- It is one more than a prime number.
- The sum of its digits is a square number.

Add together the digits of this answer to give you the seventh digit of the keypad code.

| | |
|---|--|
| Possible two-digit numbers, less than 50, which are one more than a prime number: | 12, 14, 18, 20, 24, 30, 32, 38, 42, 44, 48 |
| Which of these numbers has a square number digit sum? | 18 |

$$1 + 8 = 9$$

Clue for Digit 8

Use the clues to calculate the mystery five-digit number.

- The digits of the hundreds and ones total 12.
- It has two more ones than hundreds.
- It has one less ten thousand than ones.
- The digits of the thousands and hundreds total the same digit as the number of ten thousands.
- It has a digit sum of 22.

The tens digit of this answer will give you the eighth digit of the keypad code.

| | |
|--|--|
| Possible combinations of digits that total 12: | 9 + 3, 8 + 4, 7 + 5, 6 + 6, 5 + 7, 4 + 8, 3 + 9 |
| Which of these combinations have a difference of 2? | 7 + 5 so the number has 5 hundreds and 7 ones |
| One less number of ten thousands than ones: | There are 7 ones, so there must be 6 ten thousands. |
| The digits of the thousands and hundreds total the same digit as the number of ten thousands. | There are 6 ten thousands and 5 hundreds, so there must be 1 thousand. |
| It has a digit sum of 22. | 61 5?7 totals 19 so the tens digit must be 3 . |

Clue for Digit 9

Calculate the difference between these pairs of numbers.
Which answer appears twice?

Add together the digits of this answer to give you the ninth digit of the keypad code.

| | | | | |
|----|-----|----|-----|----|
| 1. | 23 | to | -13 | 36 |
| 2. | -16 | to | 27 | 43 |
| 3. | 26 | to | -12 | 38 |
| 4. | -11 | to | 31 | 42 |
| 5. | 21 | to | -24 | 45 |
| 6. | -8 | to | 35 | 43 |

$$4 + 3 = 7$$

Clue for Digit 10

Find the missing digits in these calculations. Which missing digit is common to both calculations?

This answer will give you the tenth digit of the keypad code.

| | | | | |
|-------|---|---|---|---|
| | 2 | 7 | 8 | 4 |
| + | 5 | 9 | 6 | 3 |
| <hr/> | | | | |
| | 8 | 7 | 4 | 7 |

| | | | | |
|-------|---|---|---|---|
| | 7 | 0 | 5 | 6 |
| - | 3 | 9 | 5 | 2 |
| <hr/> | | | | |
| | 3 | 1 | 0 | 4 |

9 appears twice.

Escape the Room Keypad Code

| Digit 1 | Digit 2 | Digit 3 | Digit 4 | Digit 5 | Digit 6 | Digit 7 | Digit 8 | Digit 9 | Digit 10 |
|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------|
| 9 | 6 | 2 | 4 | 8 | 4 | 9 | 3 | 7 | 9 |

Click on a rectangle to reveal the digit.





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