



# Redstone Logic Codebreaker

Determine the numerical value of each Minecraft ore block by solving the algebraic equations to find the four-digit passcode.

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## 1 THE KEY

$$\blacksquare = 1 \quad \heartsuit = \square \quad + = -4 \quad ? = \square \quad \triangle = \square \quad \blacklozenge = 15$$

Every symbol is a whole number from -9 to 20 (some are negative!). A number in front of a shape means multiply: 2 stars = 2 x star. A small 2 after a shape means square it: star<sup>2</sup> = star x star.

## 2 FIND THE MISSING VALUES

Some shapes in the key are missing. Use these to work them out, in order, and write them into the key.

$$+ - \blacktriangle = -17$$

$$\heartsuit + \blacktriangle = 6$$

$$\blacktriangle - \bigcirc = 21$$

## 3 CRACK THESE

$$1. \heartsuit^2 + \blacktriangle = \square$$

$$2. \blacktriangle + \bigcirc \times + = \square$$

CODE 1

$$3. 3+ - 2\blacklozenge + \heartsuit = \square$$

$$4. + - \blacklozenge = \square$$

CODE 2

$$5. \blacksquare + \blacklozenge = \square$$

$$6. \blacksquare + \blacklozenge \times + = \square$$

CODE 3

$$7. \blacklozenge + + = \square$$

$$8. \blacksquare - \blacklozenge - \blacktriangle = \square$$

CODE 4

$$9. + \times \heartsuit - \blacksquare = \square$$

$$10. +^2 - \bigcirc = \square$$

## 4 THE VAULT CODE

Write the ONES digit of your answers to problems 2, 4, 6, 8 (the ones tagged CODE 1-4), in that order. That opens the obsidian-reinforced vault door.

# Answer Key

Redstone Logic Codebreaker · Grade 7 Crack the Code

## The key

 square = **1**    
  heart = **-7** (hidden)    
  cross = **-4**    
  ring = **-8** (hidden)    
  triangle = **13** (hidden)

 pentagon = **15**

Every symbol is a whole number from -9 to 20 (some are negative!).

- |     |                                                                                |            |
|-----|--------------------------------------------------------------------------------|------------|
| 1.  | $\heartsuit^2 + \blacktriangle$ (heart <sup>2</sup> + triangle)                | <b>62</b>  |
| 2.  | $\blacktriangle + \bigcirc \times \text{+}$ (triangle + ring x cross)          | <b>45</b>  |
| 3.  | $3\text{+} - 2\blacklozenge + \heartsuit$ (3 x cross - 2 x pentagon + heart)   | <b>-49</b> |
| 4.  | $\text{+} - \blacklozenge$ (cross - pentagon)                                  | <b>-19</b> |
| 5.  | $\blacksquare + \blacklozenge$ (square + pentagon)                             | <b>16</b>  |
| 6.  | $\blacksquare + \blacklozenge \times \text{+}$ (square + pentagon x cross)     | <b>-59</b> |
| 7.  | $\blacklozenge + \text{+}$ (pentagon + cross)                                  | <b>11</b>  |
| 8.  | $\blacksquare - \blacklozenge - \blacktriangle$ (square - pentagon - triangle) | <b>-27</b> |
| 9.  | $\text{+} \times \heartsuit - \blacksquare$ (cross x heart - square)           | <b>27</b>  |
| 10. | $\text{+}^2 - \bigcirc$ (cross <sup>2</sup> - ring)                            | <b>24</b>  |

**Vault code: 5997**