



Mainframe Decryption Protocol

Calculate the numerical value of each robot part symbol to solve the equations and reveal the four-digit access key.

Name: _____ Date: _____

1 THE KEY

$$\begin{array}{l} ? = \square \quad \triangle = \square \quad \diamond = \square \quad \text{⚡} = 16 \quad \heartsuit = \square \\ \bigcirc = 4 \end{array}$$

Every symbol is a whole number from 1 to 20. A number in front of a shape means multiply: 2 stars = 2 x star. A small 2 after a shape means square it: star² = 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.

$$\bullet \times \text{⚡} - \bigcirc = 76$$

$$\heartsuit - \bigcirc = 5$$

$$2\diamond + \bigcirc = 32$$

$$\blacktriangle \times \bigcirc - \bullet = 75$$

3 CRACK THESE

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

$$2. \bullet^3 - \heartsuit = \square$$

CODE 1

$$3. \heartsuit^3 - \bigcirc = \square$$

$$4. \text{⚡}^3 = \square$$

CODE 2

$$5. \blacktriangle^2 + \bigcirc^2 = \square$$

$$6. (\text{⚡} - \bullet) \times (\text{⚡} + \bullet) = \square$$

CODE 3

$$7. \diamond^2 + \text{⚡} = \square$$

$$8. (\bullet + \text{⚡})^2 = \square$$

CODE 4

$$9. \text{⚡}^2 - \bullet^2 = \square$$

$$10. \blacktriangle^2 + \bullet^2 = \square$$

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 central mainframe core.

Answer Key

Mainframe Decryption Protocol · Grade 6 Crack the Code

The key

● circle = 5 (hidden) ▲ triangle = 20 (hidden) ◆ diamond = 14 (hidden) ⚡ lightning bolt = 16
 ♥ heart = 9 (hidden) ○ ring = 4

Every symbol is a whole number from 1 to 20.

- | | |
|--|-------------|
| 1. ◆ ² + ♥ (diamond ² + heart) | 205 |
| 2. ● ³ - ♥ (circle ³ - heart) | 116 |
| 3. ♥ ³ - ○ (heart ³ - ring) | 725 |
| 4. ⚡ ³ (lightning bolt ³) | 4096 |
| 5. ▲ ² + ○ ² (triangle ² + ring ²) | 416 |
| 6. (⚡ - ●) × (⚡ + ●) ((lightning bolt - circle) × (lightning bolt + circle)) | 231 |
| 7. ◆ ² + ⚡ (diamond ² + lightning bolt) | 212 |
| 8. (● + ⚡) ² ((circle + lightning bolt) ²) | 441 |
| 9. ⚡ ² - ● ² (lightning bolt ² - circle ²) | 231 |
| 10. ▲ ² + ● ² (triangle ² + circle ²) | 425 |

Vault code: 6 6 1 1