

The Cipher of the Hakone Puzzle Box

Solve the algebraic equations represented by traditional Japanese symbols to determine the four-digit combination that opens the secret compartment.

Name: _____ Date: _____

1 THE KEY

$$\begin{array}{l} \text{⚡} = \boxed{} \quad \boxed{?} = \boxed{} \quad \star = 6 \quad \blacklozenge = 5 \quad \text{☾} = \boxed{} \\ \text{♥} = \boxed{} \end{array}$$

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.

$$2 \text{ ⚡} + \star = 28$$

$$\text{♥} \times \blacklozenge = 50$$

$$\text{☾} \times \star - \text{⚡} = 85$$

$$\blacksquare - \blacklozenge = 7$$

3 CRACK THESE

$$1. \blacklozenge^2 + \blacksquare = \boxed{}$$

$$2. \blacksquare^3 = \boxed{}$$

CODE 1

$$3. (\text{⚡} - \text{♥}) \times (\text{⚡} + \text{♥}) = \boxed{}$$

$$4. \star^2 + \text{⚡}^2 = \boxed{}$$

CODE 2

$$5. \blacksquare \times \text{⚡} - \text{♥}^2 = \boxed{}$$

$$6. \text{♥}^2 + \blacksquare^2 = \boxed{}$$

CODE 3

$$7. 2 \times (\text{⚡} + \blacklozenge) - \text{☾} = \boxed{}$$

$$8. \text{♥} \times \text{☾} - \blacksquare^2 = \boxed{}$$

CODE 4

$$9. \blacksquare^2 + \text{♥} = \boxed{}$$

$$10. 3 \text{ ⚡} - 2 \blacksquare + \star = \boxed{}$$

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 locked lacquerware himitsu-bako.

Answer Key

The Cipher of the Hakone Puzzle Box · Grade 6 Crack the Code

The key

⚡ lightning bolt = **11** (hidden) ■ square = **12** (hidden) ★ star = **6** ⬠ pentagon = **5**
 🌙 moon = **16** (hidden) ♥ heart = **10** (hidden)

Every symbol is a whole number from 1 to 20.

1. ⬠² + ■ (pentagon² + square) **37**
2. ■³ (square³) **1728**
3. (⚡ - ♥) × (⚡ + ♥) ((lightning bolt - heart) x (lightning bolt + heart)) **21**
4. ★² + ⚡² (star² + lightning bolt²) **157**
5. ■ × ⚡ - ♥² (square x lightning bolt - heart²) **32**
6. ♥² + ■² (heart² + square²) **244**
7. 2 × (⚡ + ⬠) - 🌙 (2 x (lightning bolt + pentagon) - moon) **16**
8. ♥ × 🌙 - ■² (heart x moon - square²) **16**
9. ■² + ♥ (square² + heart) **154**
10. 3⚡ - 2■ + ★ (3 x lightning bolt - 2 x square + star) **15**

Vault code: **8 7 4 6**