



The Culinary Codebreaker

Solve the algebraic food equations to crack the code and open the master pastry chef's locked spice safe.

Name: _____ Date: _____

1 THE KEY

$$\begin{array}{l} \text{+} = \square \quad \blacksquare = 18 \quad \text{?} = \square \quad \text{?} = \square \quad \blacklozenge = 11 \\ \text{?} = \square \end{array}$$

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.

$$\text{?} \times \blacksquare = 342$$

$$\text{+}^2 = 81$$

$$\text{?} \times \text{?} = 380$$

$$\bullet^2 = 64$$

3 CRACK THESE

$$1. \blacklozenge \times \text{?} - \bullet^2 = \square$$

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

CODE 1

$$3. \blacklozenge^2 + \text{+} = \square$$

$$4. \text{?}^3 - \blacklozenge = \square$$

CODE 2

$$5. 2 \times (\bullet + \text{?}) - \blacklozenge = \square$$

$$6. \blacklozenge^2 - \bullet^2 = \square$$

CODE 3

$$7. 2 \times (\text{?} + \text{?}) - \bullet = \square$$

$$8. \text{?}^3 = \square$$

CODE 4

$$9. \bullet^3 = \square$$

$$10. \text{+}^2 + \text{?}^2 = \square$$

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 master pastry safe.

Answer Key

The Culinary Codebreaker · Grade 6 Crack the Code

The key

+ cross = 9 (hidden) ■ square = 18 ⬠ pentagon = 20 (hidden) ☾ moon = 19 (hidden)
 ◆ diamond = 11 ● circle = 8 (hidden)

Every symbol is a whole number from 1 to 20.

- | | | |
|-----|---|------|
| 1. | $\text{◆} \times \text{☾} - \text{●}^2$ (diamond x moon - circle ²) | 145 |
| 2. | $(\text{☾} + \text{●})^2$ ((moon + circle) ²) | 729 |
| 3. | $\text{◆}^2 + \text{+}$ (diamond ² + cross) | 130 |
| 4. | $\text{☾}^3 - \text{◆}$ (moon ³ - diamond) | 6848 |
| 5. | $2 \times (\text{●} + \text{⬠}) - \text{◆}$ (2 x (circle + pentagon) - diamond) | 45 |
| 6. | $\text{◆}^2 - \text{●}^2$ (diamond ² - circle ²) | 57 |
| 7. | $2 \times (\text{☾} + \text{⬠}) - \text{●}$ (2 x (moon + pentagon) - circle) | 70 |
| 8. | ⬠^3 (pentagon ³) | 8000 |
| 9. | ●^3 (circle ³) | 512 |
| 10. | $\text{+}^2 + \text{⬠}^2$ (cross ² + pentagon ²) | 481 |

Vault code: 9870