



Crack the Vault Code

Someone locked the vault with a 4-digit code. Work out what each shape is worth and crack it.

Name: _____ Date: _____

1 THE KEY

$$\begin{array}{l} \text{Pentagon} = 1 \quad \text{Hexagon with ?} = \square \quad \text{Star} = \square \quad \text{Triangle with ?} = \square \quad \text{Circle with ?} = \square \\ \text{Crescent} = 4 \end{array}$$

Every symbol is a whole number from 1 to 30. 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. sqrt(shape) is the square root of that shape's value.

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.

$$\star + 2 \blacklozenge = 42$$

$$2 \star - 2 \blacklozenge = 42$$

$$2 \blacktriangle + \blacklozenge = 23$$

$$\bullet^2 = 625$$

3 CRACK THESE

$$1. \quad 2 \star^2 + \blacktriangle = \square$$

$$2. \quad 3 \text{Crescent} - 2 \blacktriangle + \star = \square$$

CODE 1

$$3. \quad \text{Crescent}^3 - \bullet = \square$$

$$4. \quad \text{sqrt}(\bullet) + \blacklozenge = \square$$

CODE 2

$$5. \quad \text{sqrt}(\bullet) + \text{Pentagon}^2 = \square$$

$$6. \quad \blacklozenge^2 + \blacktriangle^2 = \square$$

CODE 3

$$7. \quad 2 \star^2 + \bullet = \square$$

$$8. \quad \star^2 + \bullet^2 = \square$$

CODE 4

$$9. \quad \blacklozenge \times \star - \blacktriangle^2 = \square$$

$$10. \quad (\star - \blacklozenge) \times (\star + \blacklozenge) = \square$$

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 vault.

Answer Key

Crack the Vault Code · Grade 8 Crack the Code

The key

 pentagon = **1**
  hexagon = **7** (hidden)
  star = **28** (hidden)
  triangle = **11** (hidden)
 circle = **25** (hidden)
 moon = **4**

Every symbol is a whole number from 1 to 30.

- | | | |
|-----|--|-------------|
| 1. | $2\star^2 + \triangle$ (2 x star ² + triangle) | 1579 |
| 2. | $3\text{☾} - 2\triangle + \star$ (3 x moon - 2 x triangle + star) | 18 |
| 3. | $\text{☾}^3 - \bullet$ (moon ³ - circle) | 39 |
| 4. | $\text{sqrt}(\bullet) + \hexagon$ (sqrt(circle) + hexagon) | 12 |
| 5. | $\text{sqrt}(\bullet) + \text{pentagon}^2$ (sqrt(circle) + pentagon ²) | 6 |
| 6. | $\hexagon^2 + \triangle^2$ (hexagon ² + triangle ²) | 170 |
| 7. | $2\star^2 + \bullet$ (2 x star ² + circle) | 1593 |
| 8. | $\star^2 + \bullet^2$ (star ² + circle ²) | 1409 |
| 9. | $\hexagon \times \star - \triangle^2$ (hexagon x star - triangle ²) | 75 |
| 10. | $(\star - \hexagon) \times (\star + \hexagon)$ ((star - hexagon) x (star + hexagon)) | 735 |

Vault code: **8209**