

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

$$\begin{array}{ccccccc} \boxed{?} = \boxed{} & \boxed{?} = \boxed{} & \boxed{?} = \boxed{} & \text{⚡} = 11 & \boxed{?} = \boxed{} \\ \blacksquare = 16 \end{array}$$

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.

$$\text{⬠} \times \text{⬠} = 272$$

$$2 \text{⬠} + \text{⬠} = 37$$

$$\text{★} \times \text{⬠} - \text{⚡} = 295$$

$$\text{○} \times \text{⬠} - \text{⬠} = 31$$

3 CRACK THESE

$$1. \text{⬠}^2 - \text{⬠}^2 = \boxed{}$$

$$2. (\text{○} + \text{★})^2 = \boxed{}$$

CODE 1

$$3. \text{○}^3 = \boxed{}$$

$$4. \text{⬠}^3 - \text{○} = \boxed{}$$

CODE 2

$$5. 3 \text{⬠} - 2 \text{○} + \text{⬠} = \boxed{}$$

$$6. \text{⬠}^2 + \text{★}^2 = \boxed{}$$

CODE 3

$$7. \text{★} \times \text{⬠} - \text{⬠}^2 = \boxed{}$$

$$8. (\text{★} + \text{⚡})^2 = \boxed{}$$

CODE 4

$$9. 2 \times (\text{⬠} + \text{★}) - \text{○} = \boxed{}$$

$$10. 3 \text{○} - 2 \text{⚡} + \text{⬠} = \boxed{}$$

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 vault.

Answer Key

Crack the Vault Code · Grade 6 Crack the Code

The key

 hexagon = **17** (hidden)
  ring = **3** (hidden)
  pentagon = **10** (hidden)
  lightning bolt = **11**
 star = **18** (hidden)
 square = **16**

Every symbol is a whole number from 1 to 20.

1. $\text{hexagon}^2 - \text{square}^2$ (hexagon² - square²) **33**
2. $(\text{ring} + \text{star})^2$ ((ring + star)²) **441**
3. ring^3 (ring³) **27**
4. $\text{square}^3 - \text{ring}$ (square³ - ring) **4093**
5. $3 \times \text{pentagon} - 2 \times \text{ring} + \text{hexagon}$ (3 x pentagon - 2 x ring + hexagon) **41**
6. $\text{square}^2 + \text{star}^2$ (square² + star²) **580**
7. $\text{star} \times \text{square} - \text{pentagon}^2$ (star x square - pentagon²) **188**
8. $(\text{star} + \text{lightning bolt})^2$ ((star + lightning bolt)²) **841**
9. $2 \times (\text{square} + \text{star}) - \text{ring}$ (2 x (square + star) - ring) **65**
10. $3 \times \text{ring} - 2 \times \text{lightning bolt} + \text{hexagon}$ (3 x ring - 2 x lightning bolt + hexagon) **4**

Vault code: **1 3 0 1**