

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

$$\blacklozenge = 12 \quad \heartsuit = -7 \quad \star = \square \quad \text{pentagon with ?} = \square \quad \text{circle with ?} = \square \quad + = 6$$

Every symbol is a whole number from -9 to 20 (some are negative!). 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.

$$\bigcirc \times \heartsuit = -91$$

$$\star - + = -12$$

$$\text{pentagon} \times \star = -60$$

3 CRACK THESE

$$1. \heartsuit - \blacklozenge - \text{pentagon} = \square$$

$$2. (\text{pentagon} + \bigcirc) \times \blacklozenge = \square$$

CODE 1

$$3. \blacklozenge^2 + \heartsuit = \square$$

$$4. 3\blacklozenge - 2\text{pentagon} + \star = \square$$

CODE 2

$$5. \bigcirc \times \heartsuit - \blacklozenge = \square$$

$$6. \star + + = \square$$

CODE 3

$$7. \blacklozenge - \star - \text{pentagon} = \square$$

$$8. \heartsuit - \star = \square$$

CODE 4

$$9. + + \blacklozenge \times \heartsuit = \square$$

$$10. \blacklozenge + + = \square$$

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 7 Crack the Code

The key

◆ diamond = **12** ♥ heart = **-7** ★ star = **-6** (hidden) ⬠ pentagon = **10** (hidden) ○ ring = **13** (hidden)
 + cross = **6**

Every symbol is a whole number from -9 to 20 (some are negative!).

1. ♥ - ◆ - ⬠ (heart - diamond - pentagon) **-29**
2. (⬠ + ○) × ◆ ((pentagon + ring) x diamond) **276**
3. ◆² + ♥ (diamond² + heart) **137**
4. 3◆ - 2⬠ + ★ (3 x diamond - 2 x pentagon + star) **10**
5. ○ × ♥ - ◆ (ring x heart - diamond) **-103**
6. ★ + + (star + cross) **0**
7. ◆ - ★ - ⬠ (diamond - star - pentagon) **8**
8. ♥ - ★ (heart - star) **-1**
9. + + ◆ × ♥ (cross + diamond x heart) **-78**
10. ◆ + + (diamond + cross) **18**

Vault code: **6001**