Redstone Logic Codebreaker

Determine the numerical value of each Minecraft ore block by solving the algebraic equations to find the four-digit passcode.

Name: _____ **Date:** _____

1 THE KEY

■ = 1 ♡? = ☐ ✚ = -4 ? = ☐ △? = ☐ ⬟ = 15

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: star^2 = 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.

✚ - ▲ = -17

♥ + ▲ = 6

▲ - ○ = 21

3 CRACK THESE

1. $♥^2$ + ▲ = ☐
2. ▲ + ○ × ✚ = ☐ CODE 1
3. 3✚ - 2⬟ + ♥ = ☐
4. ✚ - ⬟ = ☐ CODE 2
5. ■ + ⬟ = ☐
6. ■ + ⬟ × ✚ = ☐ CODE 3
7. ⬟ + ✚ = ☐
8. ■ - ⬟ - ▲ = ☐ CODE 4
9. ✚ × ♥ - ■ = ☐
10. $✚^2$ - ○ = ☐

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 obsidian-reinforced vault door.

TEACHER / PARENT

Answer Key

Redstone Logic Codebreaker · Grade 7 Crack the Code

The key

■ square = **1** ♥ heart = **-7** (hidden) ✚ cross = **-4** ○ ring = **-8** (hidden) ▲ triangle = **13** (hidden)
⬟ pentagon = **15**

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

1. ♥² + ▲ (heart^2 + triangle) **62**
2. ▲ + ○ × ✚ (triangle + ring x cross) **45**
3. 3✚ - 2⬟ + ♥ (3 x cross - 2 x pentagon + heart) **-49**
4. ✚ - ⬟ (cross - pentagon) **-19**
5. ■ + ⬟ (square + pentagon) **16**
6. ■ + ⬟ × ✚ (square + pentagon x cross) **-59**
7. ⬟ + ✚ (pentagon + cross) **11**
8. ■ - ⬟ - ▲ (square - pentagon - triangle) **-27**
9. ✚ × ♥ - ■ (cross x heart - square) **27**
10. ✚² - ○ (cross^2 - ring) **24**

Vault code: **5 9 9 7**