

Four Values Task Cards

Print double-sided, flipping on the long edge. Cut along the frames.

1

Copy this grid onto your board.

7	"7"
7.5	false

Each of you picks the one that **doesn't belong**, and gives a reason. There is more than one right answer.

2

Find a reason for **every** corner. Write the reason beside it.

3

7 and "7" look almost the same.

Would $7 + 7$ and $"7" + "7"$ give the same answer?

What do you think a computer does with each?

4

Sort the four values into **kinds**:

- a whole number
- a number with a decimal point
- some text
- a yes-or-no answer

Then add one new value of your own to each kind.

5

Where in a **game** would you use each kind?
Give one example for each.

6

The AP exam writes code in its own way.
Read this line aloud, then say in your own words what it does.

a ← 5

Four Values Task Cards — Backs

Answers for the cards on the other side of this sheet.

2 — answer

7: the only whole number.
"7": the only one in quotation marks, so the only text.
7.5: the only one with a decimal point.
false: not a number or text. A yes-or-no answer.

1 — answer

Any corner, with a reason.
For example: **false** is the only one that is not a number.

4 — answer

7: whole number. 7.5: decimal. "7": text. **false**: yes-or-no, and **true** is the only other one.

3 — answer

No. $7 + 7$ is 14.
"7" + "7" is "77": the quotation marks make text, and text is joined, not added.

6 — answer

"a gets 5": store 5 in **a**.
That is an **assignment**.
In Swift, the same line is **a = 5**,
and **=** is the assignment operator.

5 — answer

A score: whole number. A timer or a price: decimal. A player's name: text. Is the game over? yes-or-no.

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7

Trace these two lines. What does **b** hold at the end?

`a ← 5`

`b ← a`

Is **b** **linked** to **a** from now on, or does **b** have its own **copy**?

8

Here is the next line.

`a ← a + 3`

Does it make sense as a math equation?

What does the computer do with it?

9

Put it all together. What does this code display?

`a ← 5`

`b ← a`

`a ← a + 3`

`DISPLAY(b)`

`DISPLAY(a)`

(a) 5 8 (b) 8 8 (c) 5 5 (d) 8 5

10

Someone chose (**b**). What did they think was happening?

Someone else chose (**c**). What did they think?

11

Write all five lines in **Swift**.

Use **let** or **var**, give each name its type, and use **print** where the AP code says **DISPLAY**.

Bonus

Predict: what does a computer answer for

`7 / 2`

Is it 3.5, or something else? Write your prediction down. You test it for real later today.

Four Values Task Cards — Backs

Answers for the cards on the other side of this sheet.

8 — answer

As math, nonsense. The computer works out the right side first, $5 + 3 = 8$, then stores 8 in **a**. The old 5 is gone.

7 — answer

b holds 5. Its own copy.
The value is copied once. Nothing links them afterwards.

10 — answer

(b) thinks **b** stays linked to **a**. It does not.
(c) thinks $\mathbf{a} \leftarrow \mathbf{a} + 3$ leaves **a** alone. It does not.

9 — answer

(a) 5 8.

	a	b
$\mathbf{a} \leftarrow 5$	5	
$\mathbf{b} \leftarrow \mathbf{a}$	5	5
$\mathbf{a} \leftarrow \mathbf{a} + 3$	8	5

Bonus — answer

In Swift, 3. Two whole numbers divided give a whole number: the .5 is dropped.
 $7.0 / 2$ is 3.5.

11 — answer

```
var a: Int = 5
let b: Int = a
  a = a + 3
  print(b)
  print(a)
a changes, so var. b never does, so let.
```