Solution 02: Python Basic Arithmetic

1) `int` or `float`?

- `type(a)` is `<class 'int'>`
- `type(b)` is `<class 'float'>`
- `type(c)` is `<class 'float'>`

2) Write code: add and subtract

```
x = 12
y = 5

print(x + y)
print(x - y)
```

Outputs: `17` then `7`.

3) What does it print? (two lines)

```
x = 10
y = 4

print(x - y)
print(x + y - 3)
```

Output:

```
6
11
```

4) Word problem: game points

- Points after losing `7`: `20 - 7 = 13`
- Final points after winning `5`: `13 + 5 = 18`

5) What does it print?

```
stickers_per_page = 6
pages = 4

total_stickers = stickers_per_page * pages
print(total_stickers)
```

Output:

```
24
```

6) Write code: minutes to seconds

One possible solution:

```
minutes = 7
seconds = minutes * 60
print(seconds)
```

Output: `420`

7) True division `/` (always a float)

```
print(9 / 3)
print(7 / 2)
print(1 / 4)
```

Output:

```
3.0
3.5
0.25
```

8) Floor division `//` (whole number part only)

```
print(9 // 3)
print(7 // 2)
print(1 // 4)
```

Output:

```
3
3
0
```

9) True vs floor division

```
print(9 / 2)
print(9 // 2)
```

Output:

```
4.5
4
```

10) What does it print?

```
print(10 % 3)
print(12 % 5)
print(14 % 7)
```

Output:

```
1
2
0
```

11) Even or odd?

- `14 % 2` is `0` → even
- `17 % 2` is `1` → odd

12) Sharing marbles

```
marbles = 23
friends = 4

print(marbles // friends)  # each friend gets
print(marbles % friends)   # left over
```

Output:

```
5
3
```

13) What does it print?

```
print(5 + 8 // 3)
print((5 + 8) // 3)
```

Answer:

- `8 // 3` is `2`, so first line is `5 + 2 = 7`
- `(5 + 8) // 3` is `13 // 3 = 4`

Output:

```
7
4
```

14) Precedence with `*` and `%`

```
print(10 % 4 + 3 * 2)
print((10 % 4 + 3) * 2)
```

Answer:

- `10 % 4` is `2`
- `3 * 2` is `6`
- First line: `2 + 6 = 8`
- Second line: `(2 + 3) * 2 = 5 * 2 = 10`

Output:

```
8
10
```

15) What does it print?

```
a = 3.9
b = int(a)

c = 5
d = float(c)

print(b)
print(d)
```

Output:

```
3
5.0
```

16) Build a tiny “calculator”

One possible solution:

```
a = 17
b = 5

print(a + b)   # 22
print(a - b)   # 12
print(a * b)   # 85
print(a / b)   # 3.4
print(a // b)  # 3
print(a % b)   # 2
```

Output:

```
22
12
85
3.4
3
2
```