Solution 22: Python Set Intersection

1) Meaning + syntax (fill in the blanks)

- Intersection means items that are in **both** sets.
- Syntax: `common = set1 & set2`

2) Simple intersection (what does it print?)

One possible output (order may vary):

```
{3, 4}
```

3) Empty intersection (what does it print?)

```
set()
0
```

4) Duplicates are removed (what does it print?)

One possible output (order may vary):

```
{2, 3, 4}
{1, 2, 5}
{2}
1
```

(Your set order may differ.)

5) Piano schedule conflict (fill in the blanks)

```
ada = {"Mon", "Wed"}
ben = {"Tue", "Thu"}

common = ada & ben
is_conflict = len(common) > 0

print(is_conflict)
```

Output:

```
False
```

6) Overlapping dishes (fix + answer)

The overlap is `{"salmon"}`.

```
lunch = {"steak", "salmon", "pasta"}
dinner = {"chicken", "potato", "salmon"}

overlap = lunch & dinner  # {"salmon"}
print(len(overlap))
```

Output:

```
1
```

7) Two lists → common items (write code)

One correct answer (order may vary):

```
list1 = [1, 2, 2, 3, 5]
list2 = [2, 4, 4, 5]

s1 = set(list1)
s2 = set(list2)

common = s1 & s2
print(common)
```

One possible output (order may vary):

```
{2, 5}
```

8) Print each common item (write code)

One correct answer (order may vary):

```
kid1 = {"lego", "puzzle", "ball", "drone"}
kid2 = {"puzzle", "book", "ball"}

common = kid1 & kid2

for x in common:
    print(x)
```

Output will print the two items (order may vary), for example:

```
ball
puzzle
```

9) No overlap? (what does it print?)

```
no overlap
```

10) Build the common set (fill in the blanks)

```
a = [4, 7, 2, 9, 5]
b = {2, 5, 8}

common = set()

for x in a:
    if x in b:
        common.add(x)

print(common)
```

One possible output (order may vary):

```
{2, 5}
```

11) Trace it (fill in the table)

Step	x	common (set)
0 (start)	—	`set()`
1	1	`set()`
2	2	`{2}`
3	2	`{2}`
4	3	`{2, 3}`

(Your set order may differ.)

12) Fix the bug (intersection)

Two bugs: - The loop should go through `common`, not through `b`. - The `print(x)` line must be indented.

Corrected code:

```
a = {1, 2, 3}
b = {2, 3, 4}

common = a & b

for x in common:
    print(x)
```

13) Intersection facts (True/False)

1. True
2. True
3. True
4. True

14) Common letters (what does it print?)

One possible output (order may vary):

```
{'a', 't'}
```

15) Three sets (what does it print?)

One possible output (order may vary):

```
{2, 4}
```

16) Common factors (write code)

One correct answer (order may vary):

```
n1 = 12
n2 = 18

f1 = set()
for i in range(1, n1 + 1):
    if n1 % i == 0:
        f1.add(i)

f2 = set()
for i in range(1, n2 + 1):
    if n2 % i == 0:
        f2.add(i)

common = f1 & f2
print(common)
```

One possible output (order may vary):

```
{1, 2, 3, 6}
```