Solution 10: Python For-Loop Number Problems

1) Last digit vs “remove last digit”

- `x` is `6`
- new `n` is `202`

2) Fill in the blanks (meaning)

- `n % 10` gives the **last** digit of `n`.
- `n // 10` **removes** the last digit of `n`.

3) What does this print?

Code:

```
n = 507

for _ in range(3):
    print(n % 10)
    n = n // 10
```

Output:

```
7
0
5
```

4) Complete the code (count digits)

Missing line:

```
n = n // 10
```

Full code:

```
n = 2026
count = 0

for _ in range(100):
    if n == 0:
        break
    count = count + 1
    n = n // 10

print(count)
```

5) What does it print? (`n = 90`)

`90` has 2 digits.

Output:

```
2
```

6) What does it print? (`n = 1000`)

`1000` has 4 digits.

Output:

```
4
```

7) Write code: Count digits (`n = 87531`)

One possible answer:

```
n = 87531
count = 0

for _ in range(100):
    if n == 0:
        break
    count = count + 1
    n = n // 10

print(count)
```

Output should be:

```
5
```

8) By hand: Sum of digits (`n = 2026`)

`2 + 0 + 2 + 6 = 10`

Answer: `10`

9) What does this print? (`n = 305`)

Digits are `3, 0, 5`, so the sum is `8`.

Output:

```
8
```

10) Spot the mistake (sum of digits)

Bug: `n = n / 10` makes `n` a float.

Fix: use integer division `//`.

Corrected code:

```
n = 2026
total = 0

for _ in range(100):
    if n == 0:
        break
    x = n % 10
    total = total + x
    n = n // 10

print(total)
```

11) By hand: List the factors of 15

Factors of `15` are:

`1, 3, 5, 15`

12) What does it print? (`n = 10`)

Output:

```
1
2
5
10
```

13) Write code: Print factors (`n = 18`)

One possible answer:

```
n = 18

for i in range(1, n + 1):
    if n % i == 0:
        print(i)
```

Output should be:

```
1
2
3
6
9
18
```

14) Prime or not? (True/False)

- `2` is prime: **True**
- `9` is prime: **False**
- `11` is prime: **True**
- `21` is prime: **False**

15) What is the output? (`n = 49`)

The first divisor found is `7`, so it prints `7`, then `False`.

Output:

```
7
False
```

16) Challenge: Count factors (`n = 12`)

One possible answer:

```
n = 12
count = 0

for i in range(1, n + 1):
    if n % i == 0:
        count = count + 1

print(count)
```

Output:

```
6
```