Control Flow

if else **Statement**

if condition:

    indented statement(s)

indented statement(s) # execution continues

```
x = raw_input("enter number: ")
if x < 0:
    x = abs(x)
```

if else **Statement**

if condition:

    indented statement(s)

else:

    indented statement(s)

```
def max_two(a, b):
    if a < b:
        return b
    else:
        return a
```

```
>>> max(10, 15)
15
>>> max('Mozzarella', 'brie')
'brie'
```

if else Statement with Logical Operators

```
def test_increase(a, b, c):
    if a < b and b < c:
        return True
    else:
        return False
```

```
>>> test_increase(2, 6, 4)
False
>>> test_increase('BRIE', 'BRie', 'brie')
True
```

Nested *if–elif–else* Statement

```
if condition_1:
    <statements_block_A>
elif condition_2:
     <statements_block_B>
elif condition_3:
     pass
else:
     <statements_block_C>
<statements_block_D>
```

- when do we execute A and D?
- when do we execute B and D?
- when do we execute C?
- when do we execute D?

Nested *if-elif-else* Statement

if condition_1:

statement_1

elif condition_2:

statement_2

else:

default

```
def compute_grade(score):
    if score > 90:
        return ‘A’
    elif score > 80:
        return ‘B’:
    else:
        return ‘C’
```

```
>>> compute_grade(85)
‘B’
```

Python Loop Construct

- Python has two loop constructs:

```
for <iterator> in <iterable>:
    <statements_block>
```

```
>>> for cheese in [“Mozzarella”, “Brie”]
___     print cheese
```

```
while  <test>:
    <statements_block_1>
<statements_block_2>
```

```
>>> sum = 0; counter = 0
>>> while counter < 1000:
___         sum = sum + counter
___         counter = counter + 1
```

for **Loop with** *range*

```
# ratio of consecutive Fibonacci numbers
fib_numbers = [1, 1, 2, 3, 5, 8, 13, 21, 34, 55]
for i in range(1, len(fib_numbers)):
    x = fib_numbers[i]
    y = fib_numbers[i–1]
    print (i, float(x)/y)
```

- how do we change the flow of execution?
  1) continue
  2) break

Python *continue* Statement

```
for <iterator> in <iterable>:
    <statements_block_1>
    if <test>:
        continue
    <statements_block_2>
<statements_block_3>
```

```
# ratio of consecutive odd Fibonacci numbers
fib_numbers = [1, 1, 2, 3, 5, 8, 13, 21, 34, 55]
for i in range(1, len(fib_numbers)):
    x = fib_numbers[i]
    y = fib_numbers[i–1]
    if (x%2 ==0) or (y%2==0):
      continue
    print (i, float(x)/y)
```

break **Statement**

```
for <iterator> in <iterable>:
    <statements_block_1>
    if <test>:
        break
    <statements_block_2>
<statements_block_3>
```

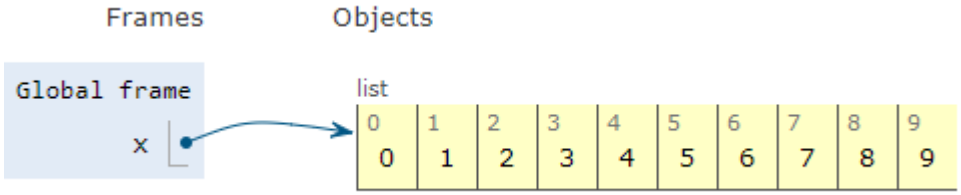
- if test is true, we exit loop and execute

```
# print first fib. Number > 25
fib_numbers = [1, 1, 2, 3, 5, 8, 13, 21, 34, 55]
for i in range(1, len(fib_numbers)):
    x = fib_numbers[i]
    if (x > 25):
      break
    print ("first fibonacci number: ", x)
```

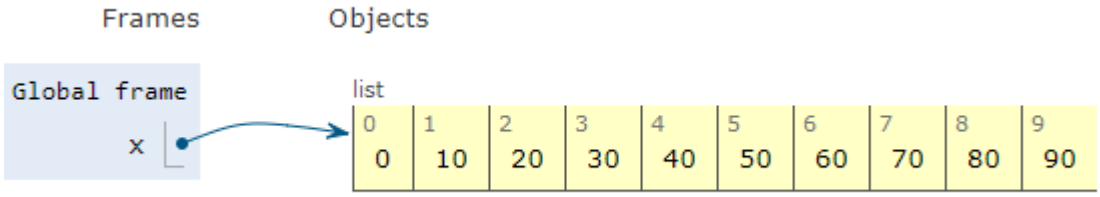
range() Examples

- format: *range*(*start*, *stop*[, *step*])
- default step is 1, default start 0

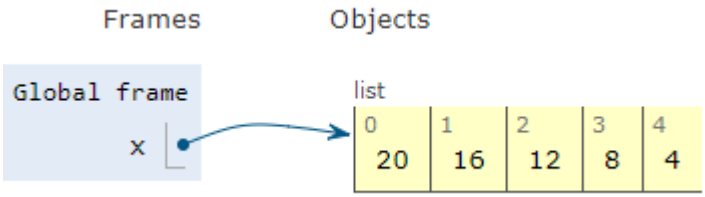
```
>>> x = range(0,10,1)
>>> x = range(10)          # shorthand
```




```
>>> x = range(0, 100, 10)   # count by 10
```

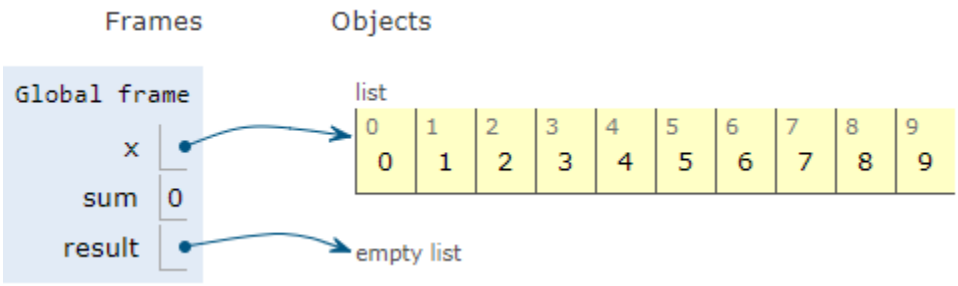



```
>>> x = range(20, 0, –4)   # backwards by 4
```

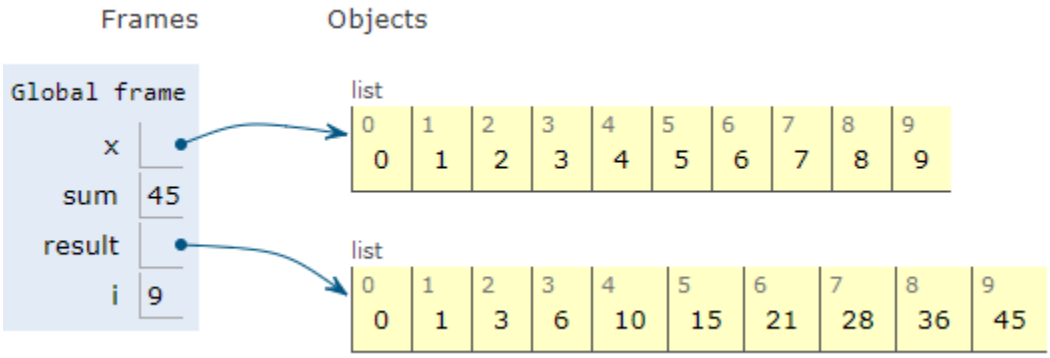


range() Example

```
>>> x = range(10)
>>> sum = 0
>>> list = []
```




```
>>> for i in x:
...         sum = sum + i
...         result.append(sum)
```




```
>>> print(result)
```

[0, 1, 3, 6, 10, 15, 21, 28, 36, 45]

Counting with range() Construct

- Python has two loop constructs:

```
for <iterator> in <iterable>:
    <statements_block>
```

```
>>> for cheese in [“Mozzarella”, “Brie”]
——      print cheese
```

```
while  <test>:
    <statements_block_1>
<statements_block_2>
```

```
>>> sum = 0; counter = 0
>>> while counter < 1000:
——          sum = sum + counter
——          counter = counter + 1
```

Review Problems

Interview Problem

- what is *pass* statement used for?

Interview Problem

- what are the two major loop statements?

Interview Problem

- explain the use of break and continue in looping

Interview Problem

- when would you use a *break* statement in a *for* loop?

Interview Problem

- what is the structure of a *for* loop?

Interview Problem

- what is the structure of a *while* loop?

Interview Problem

- under what circumstances would von use a *while* statement rather than *for*?

Interview Problem

- when would you use a *continue* statement in a *for* loop?

Interview Problem

- which statement of Python is used whenever a statement is required syntactically but the program needs no action?

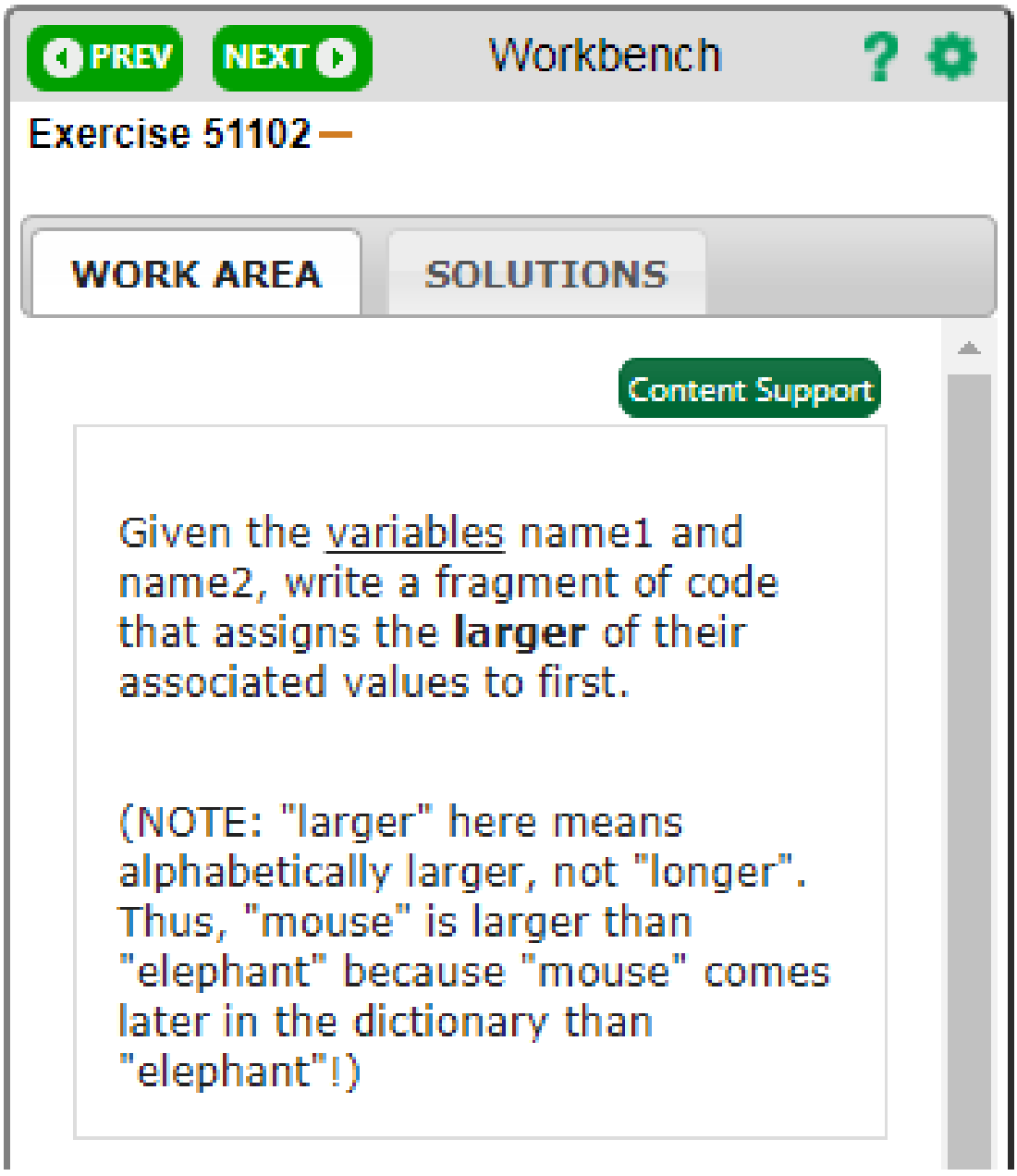
Interview Problem

- what are the optional statements to use inside a <try – except> block?

Interview Problem

- print sum of numbers from 1 to 100

Programming Exercise



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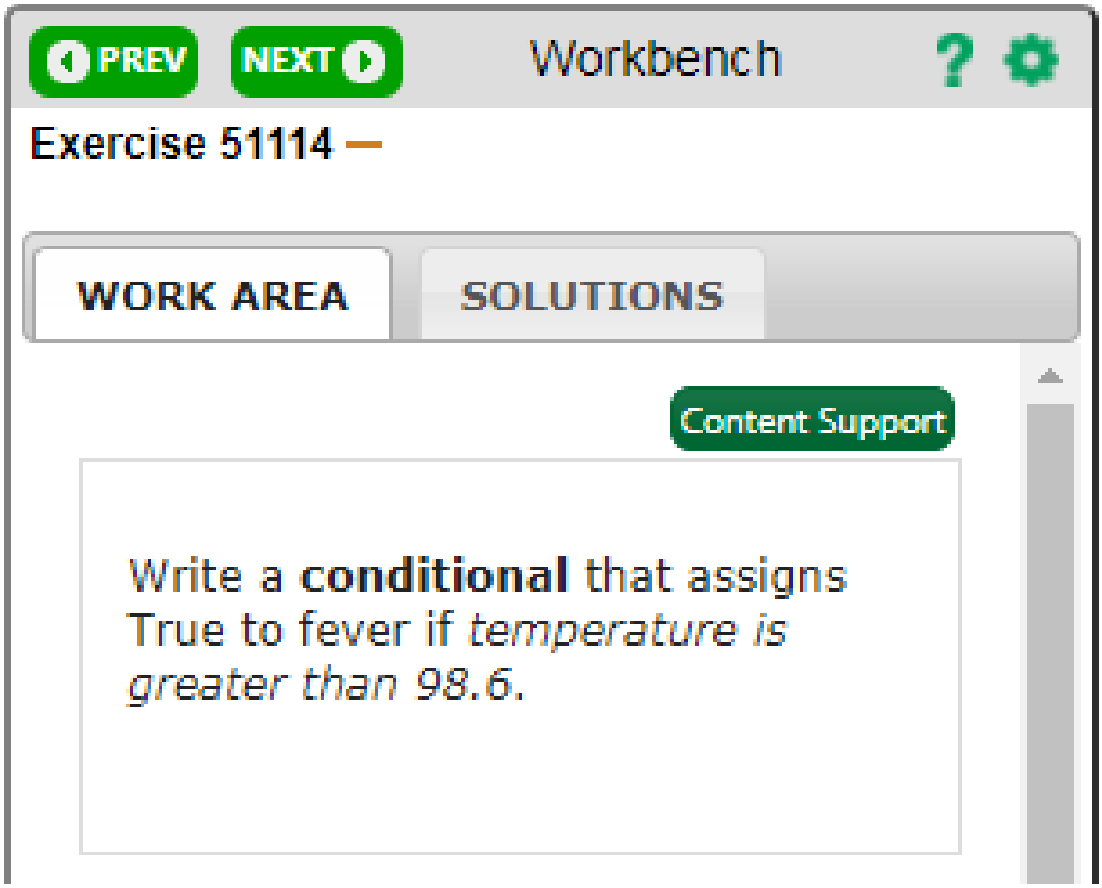

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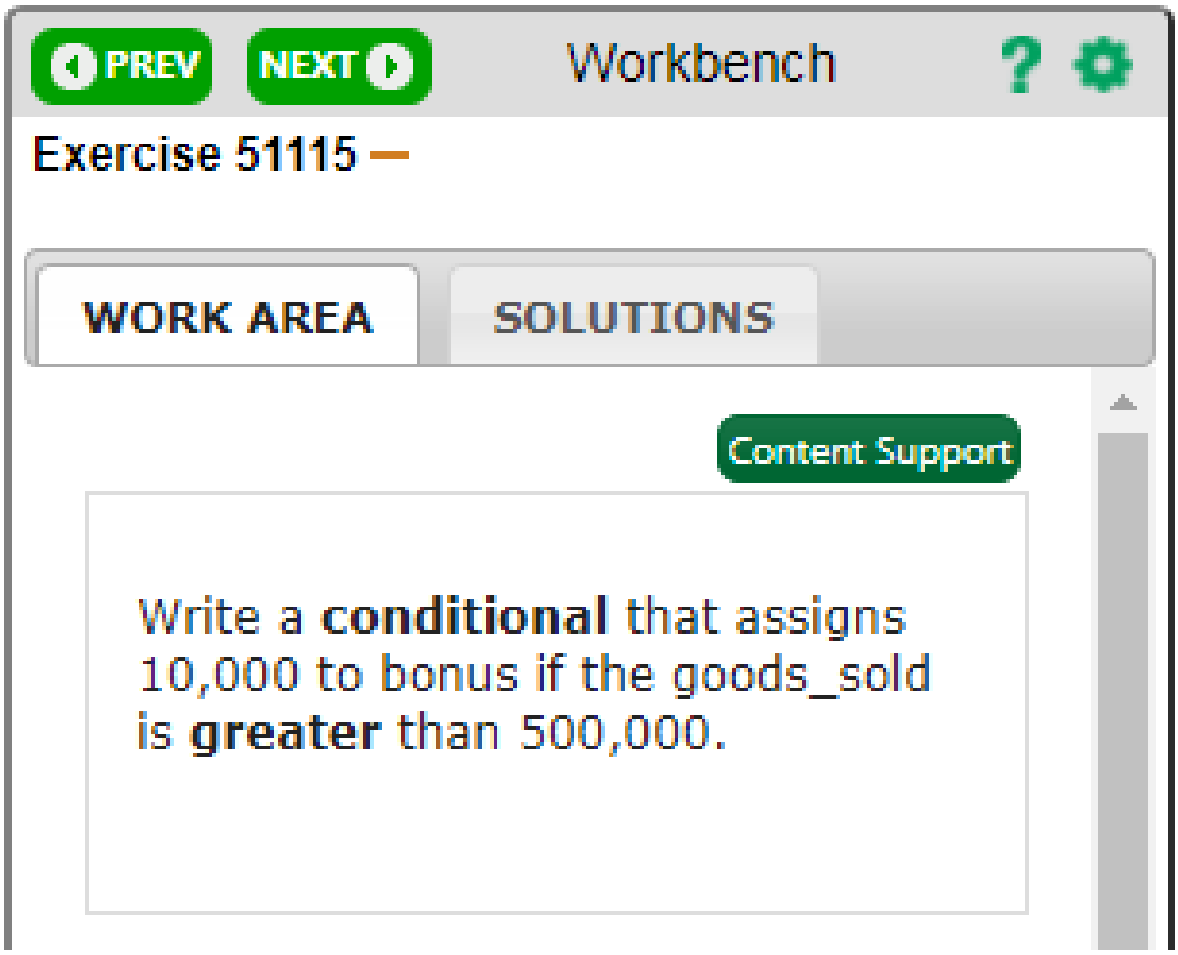

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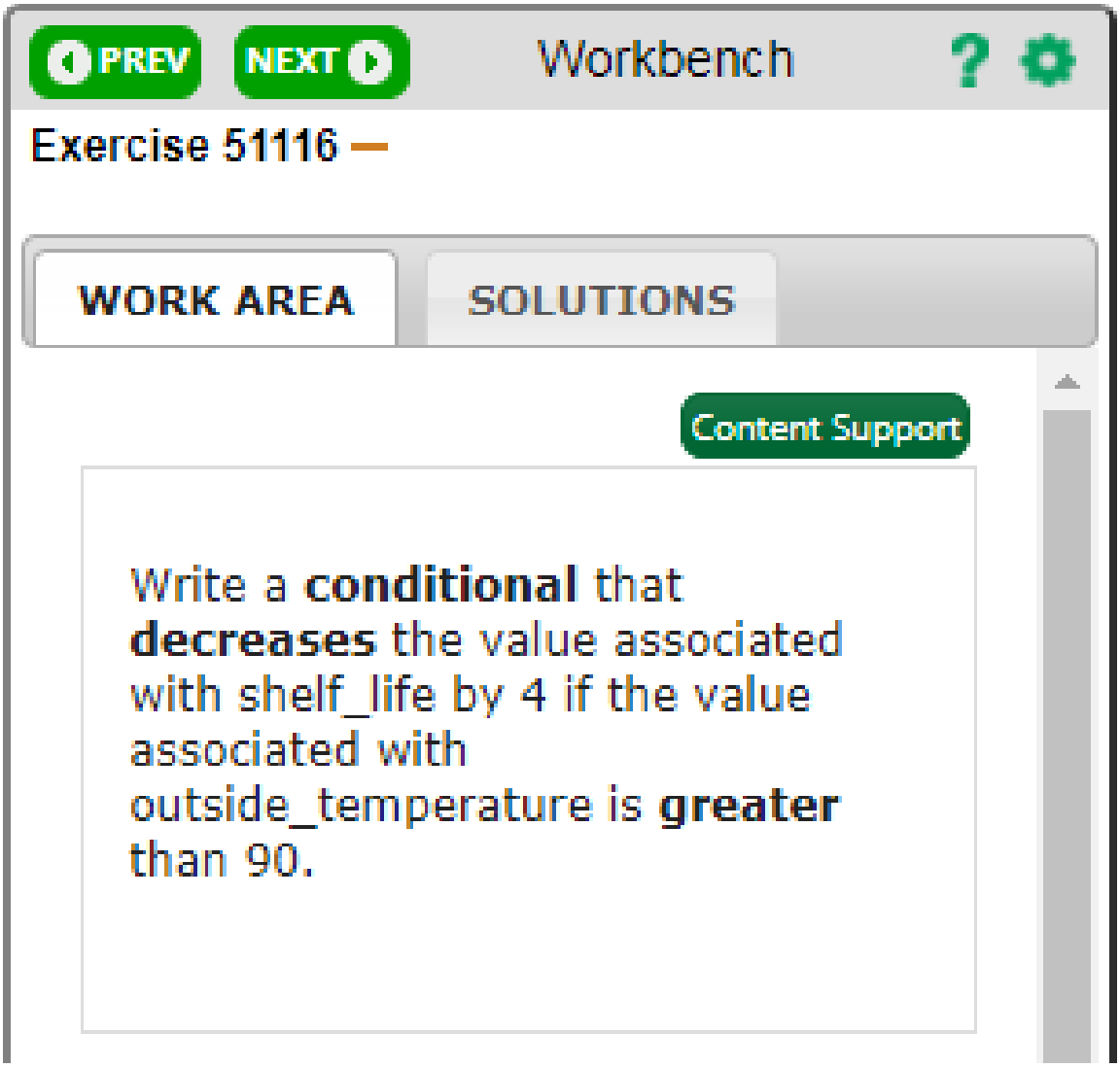

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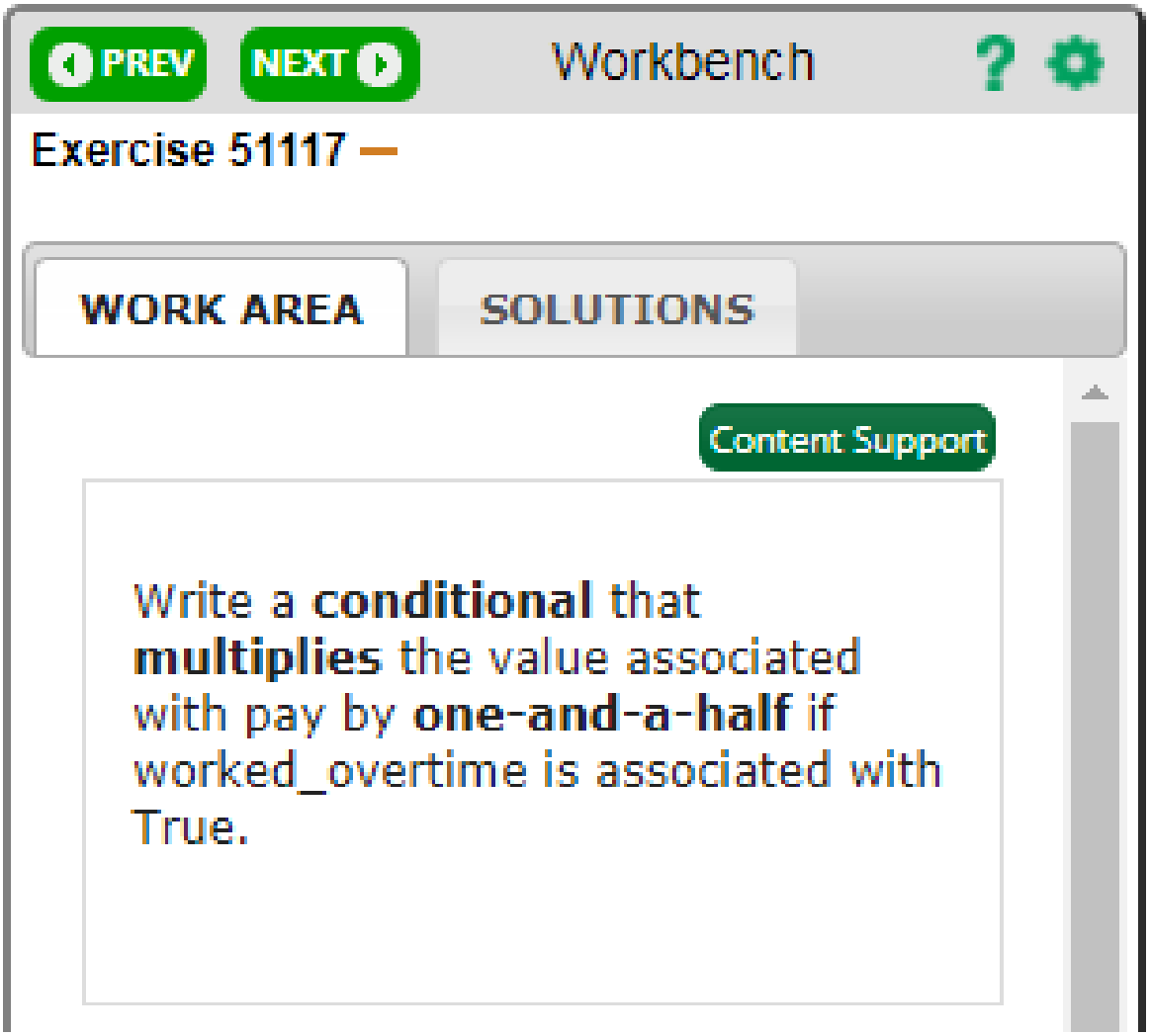

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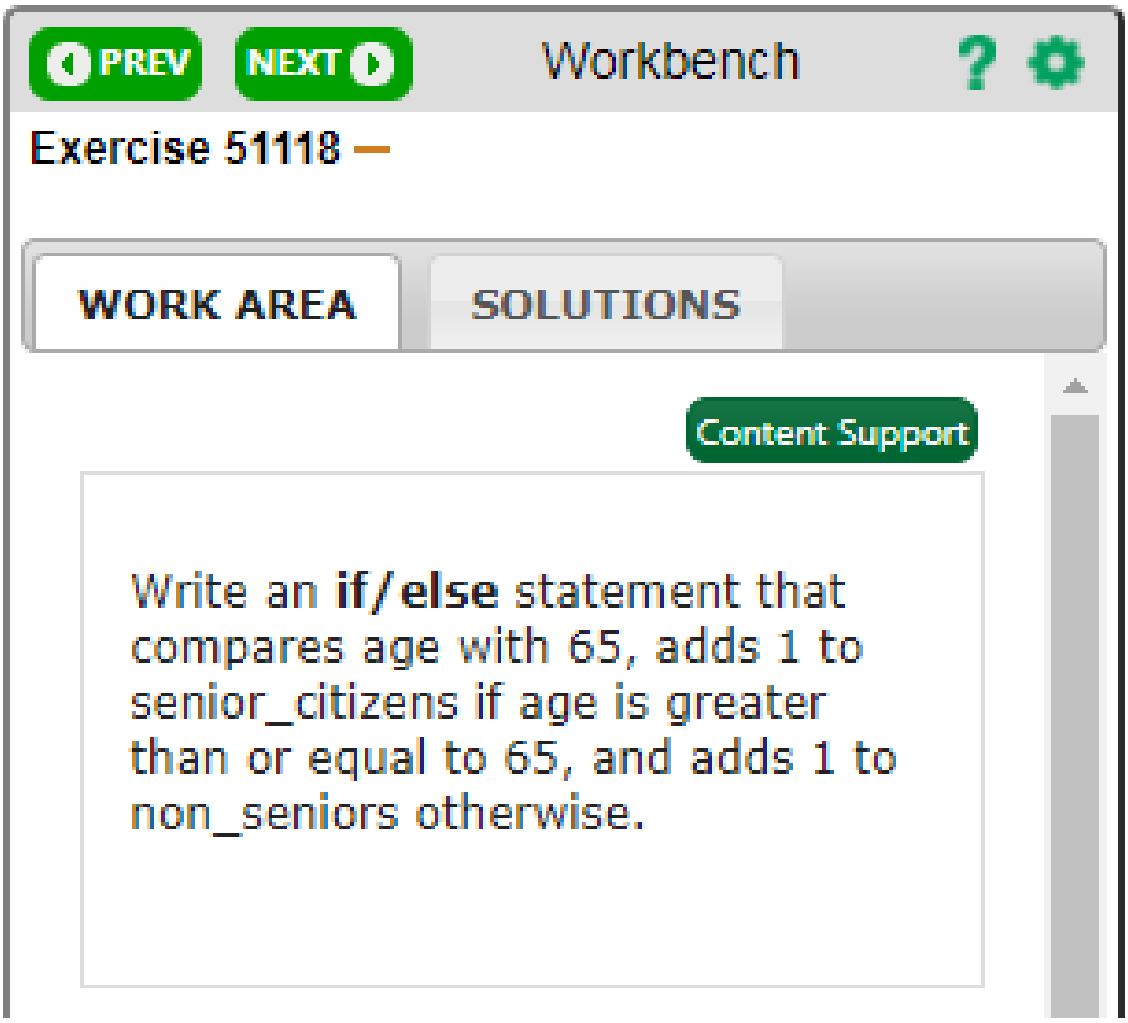

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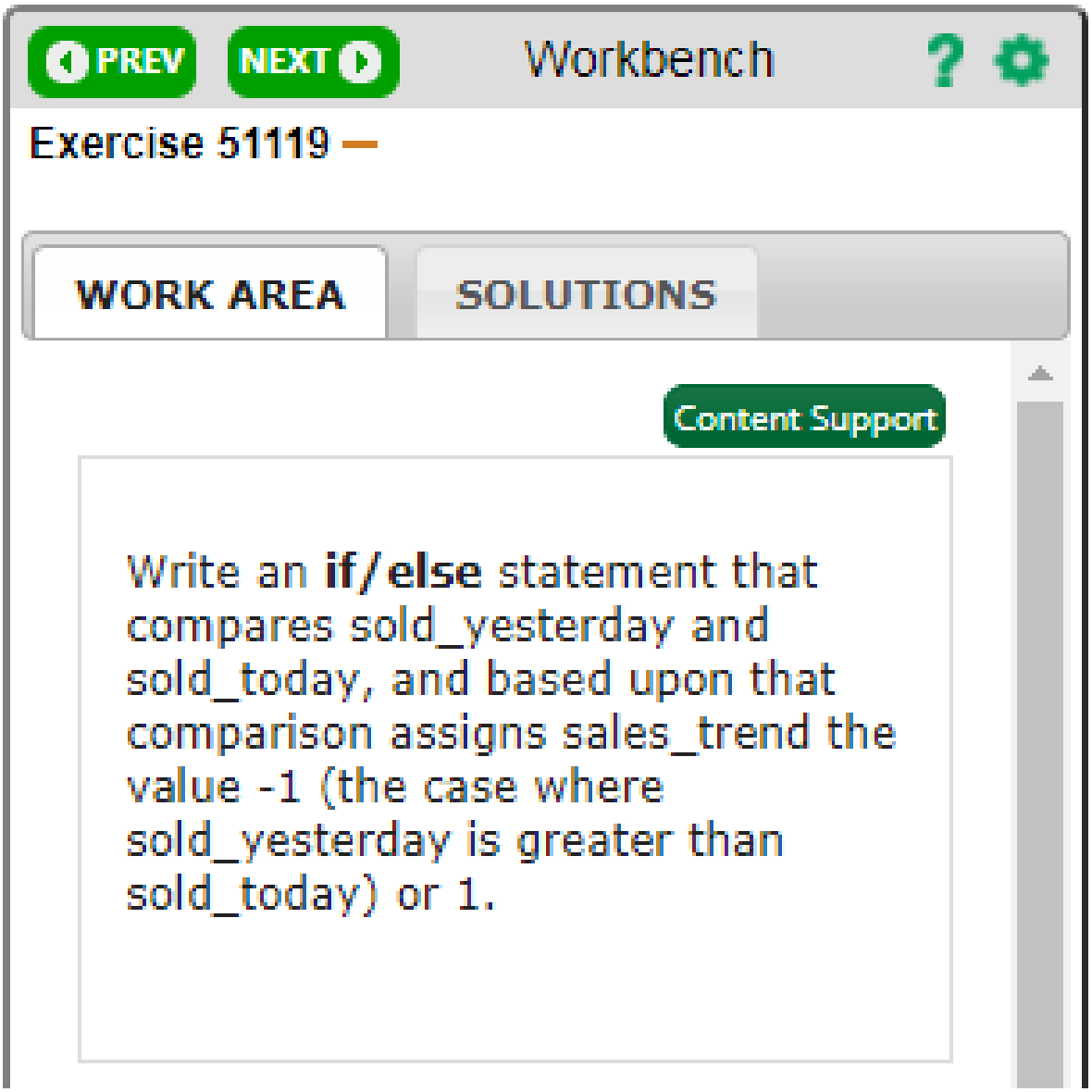

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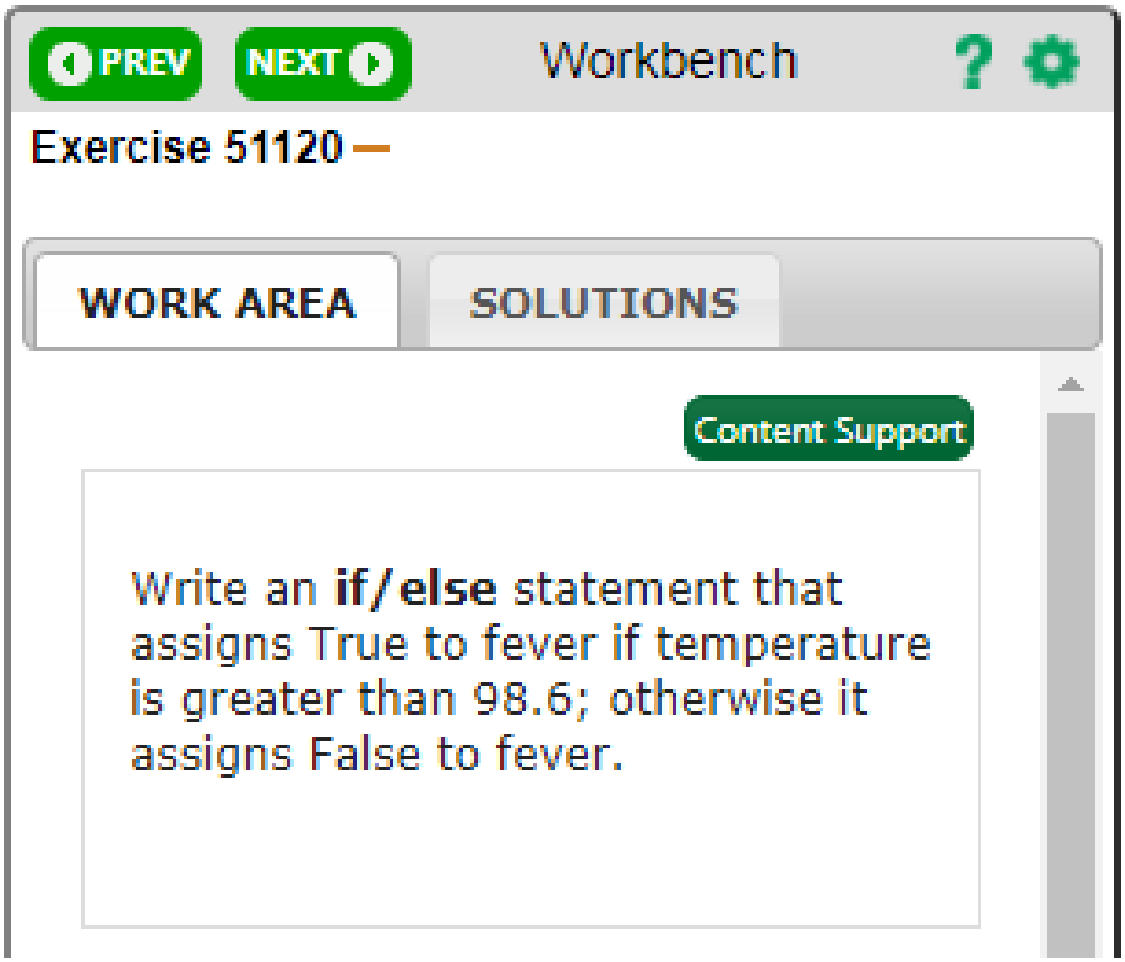

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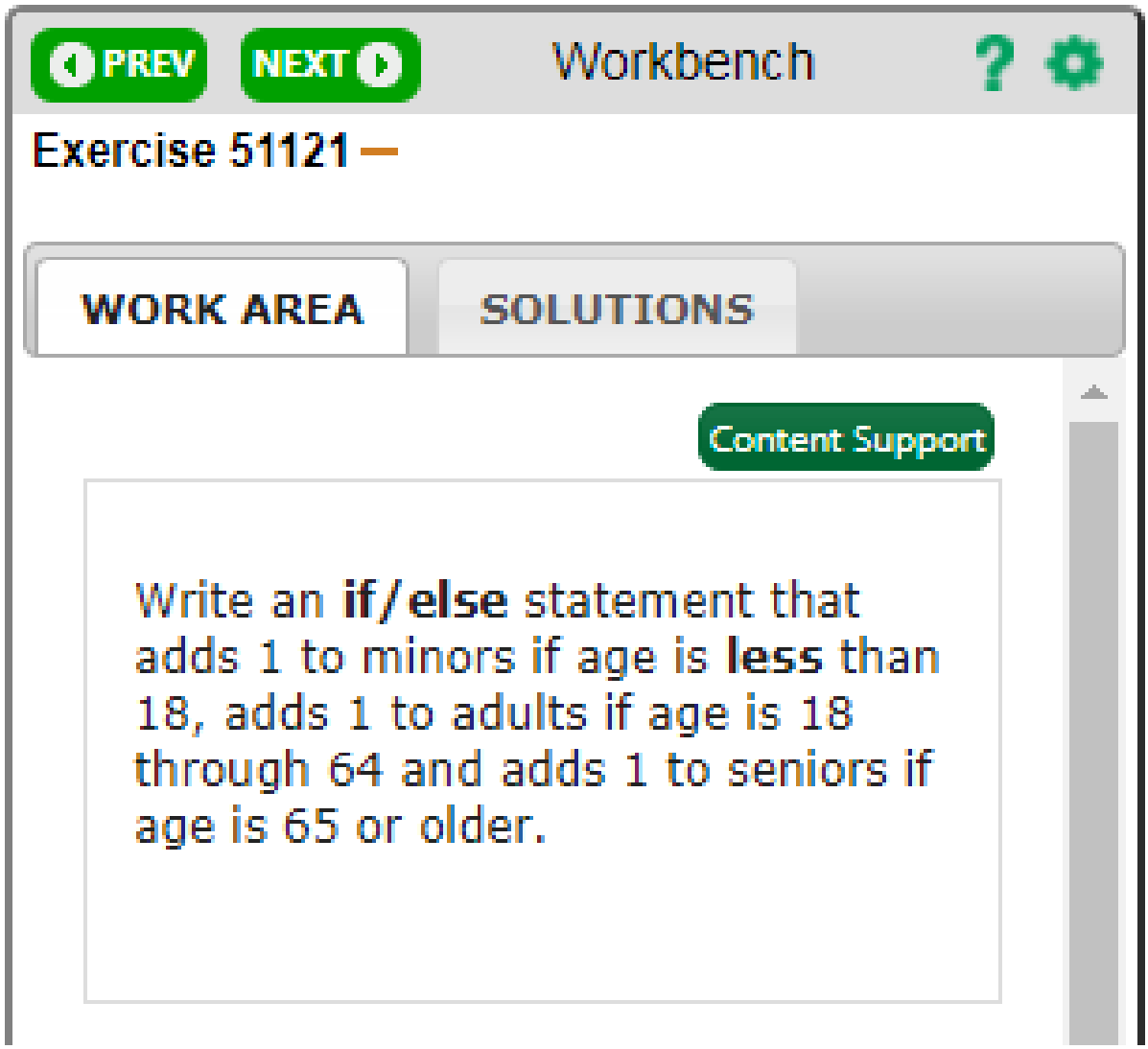

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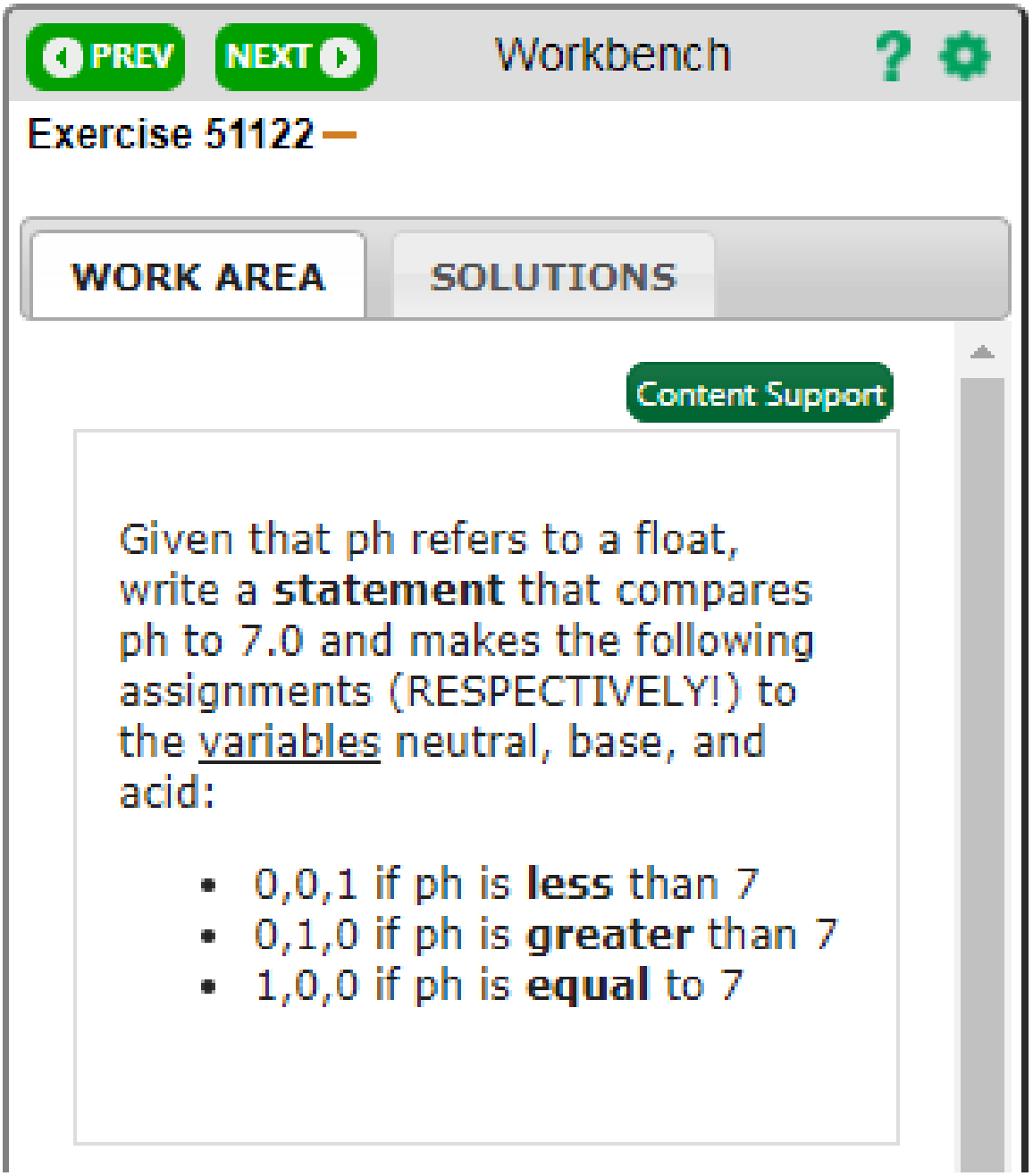

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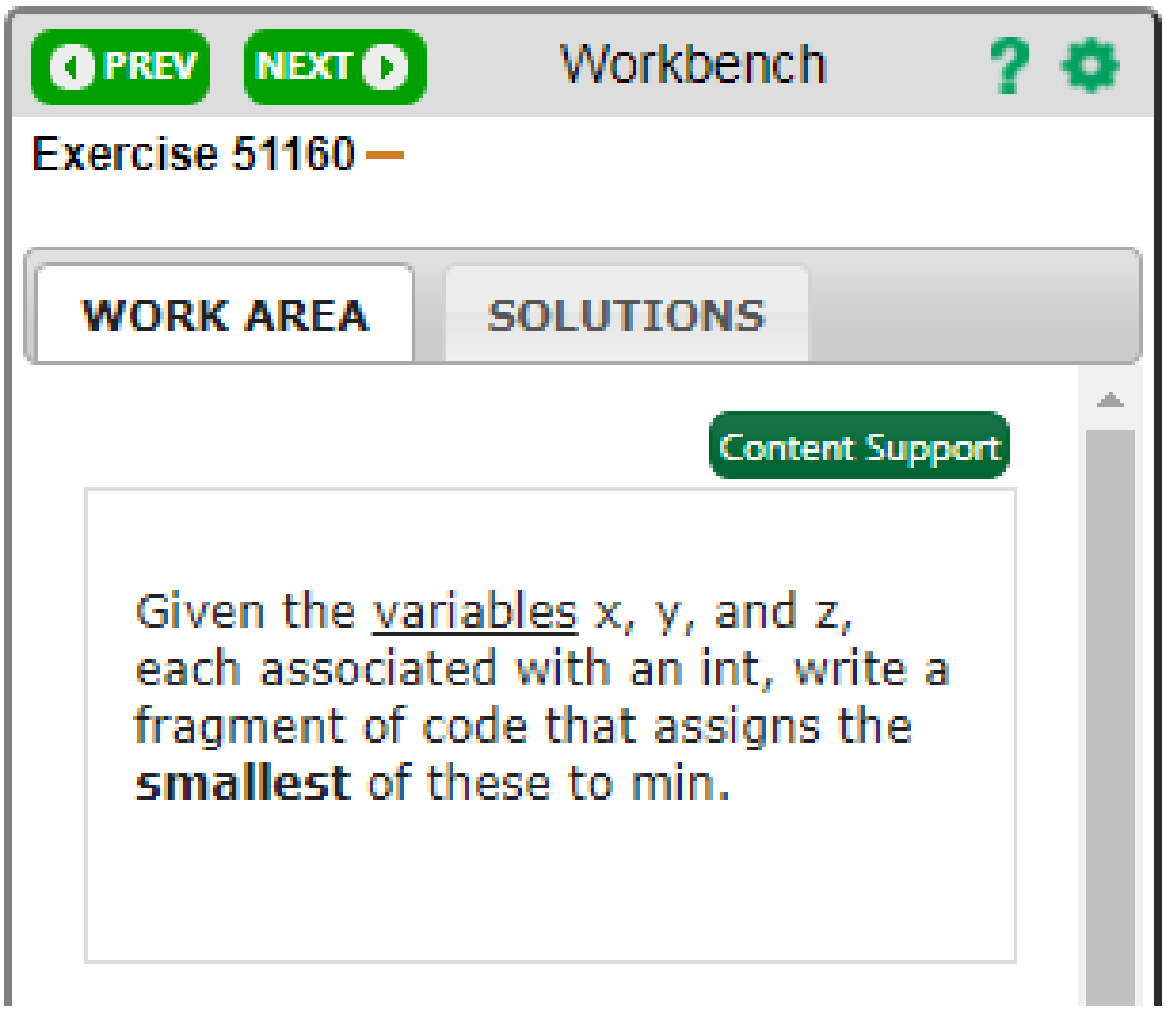

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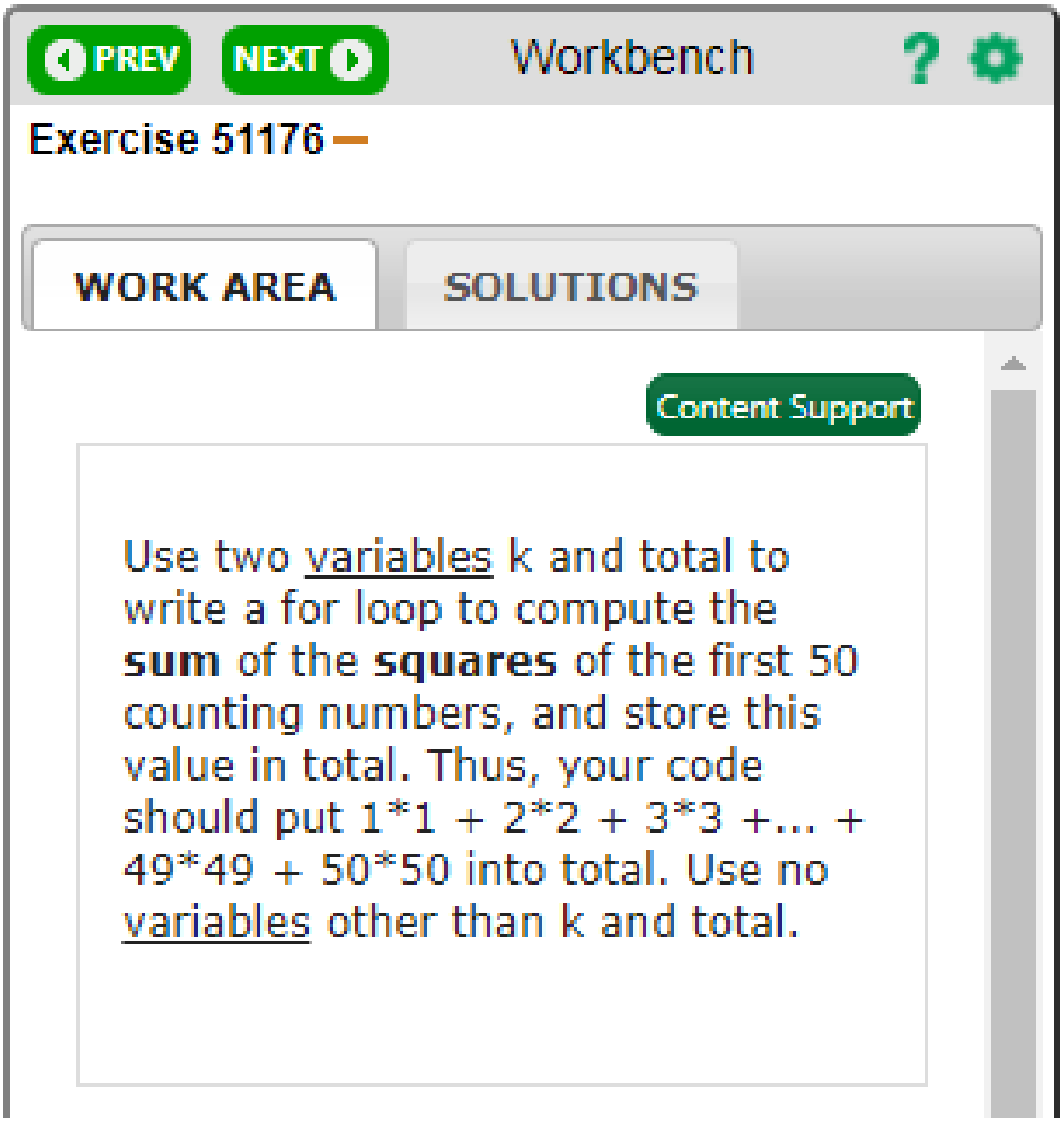

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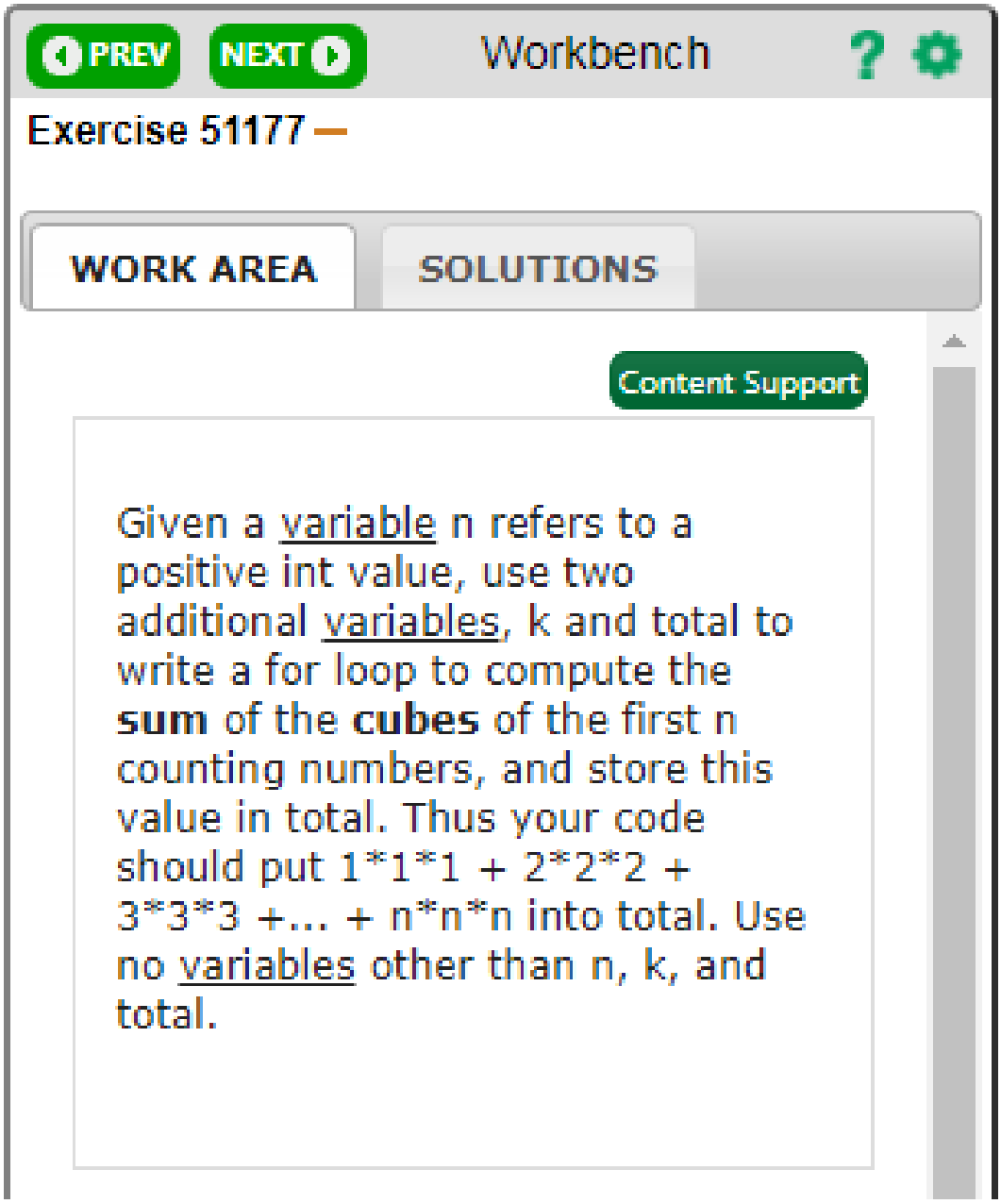

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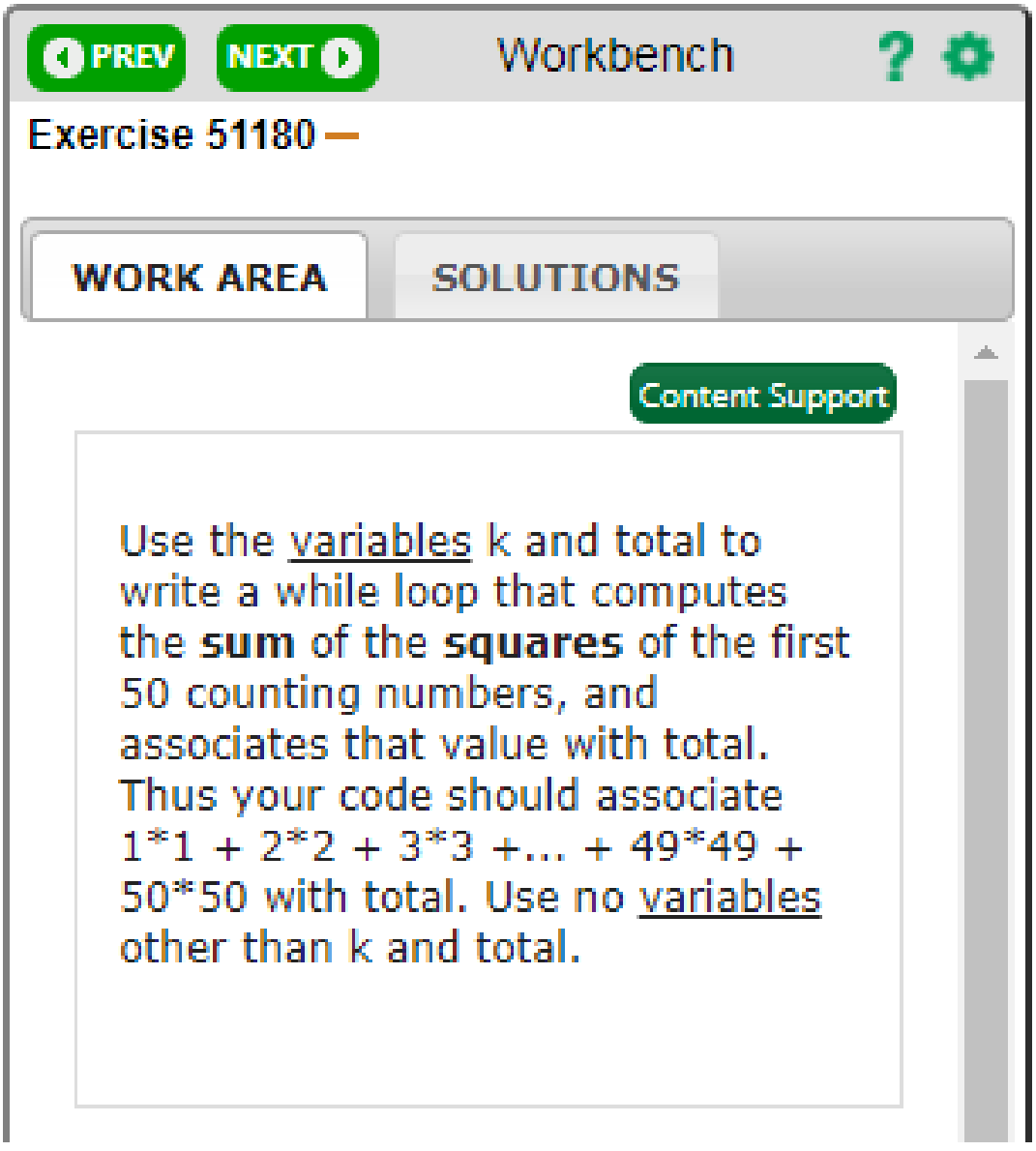

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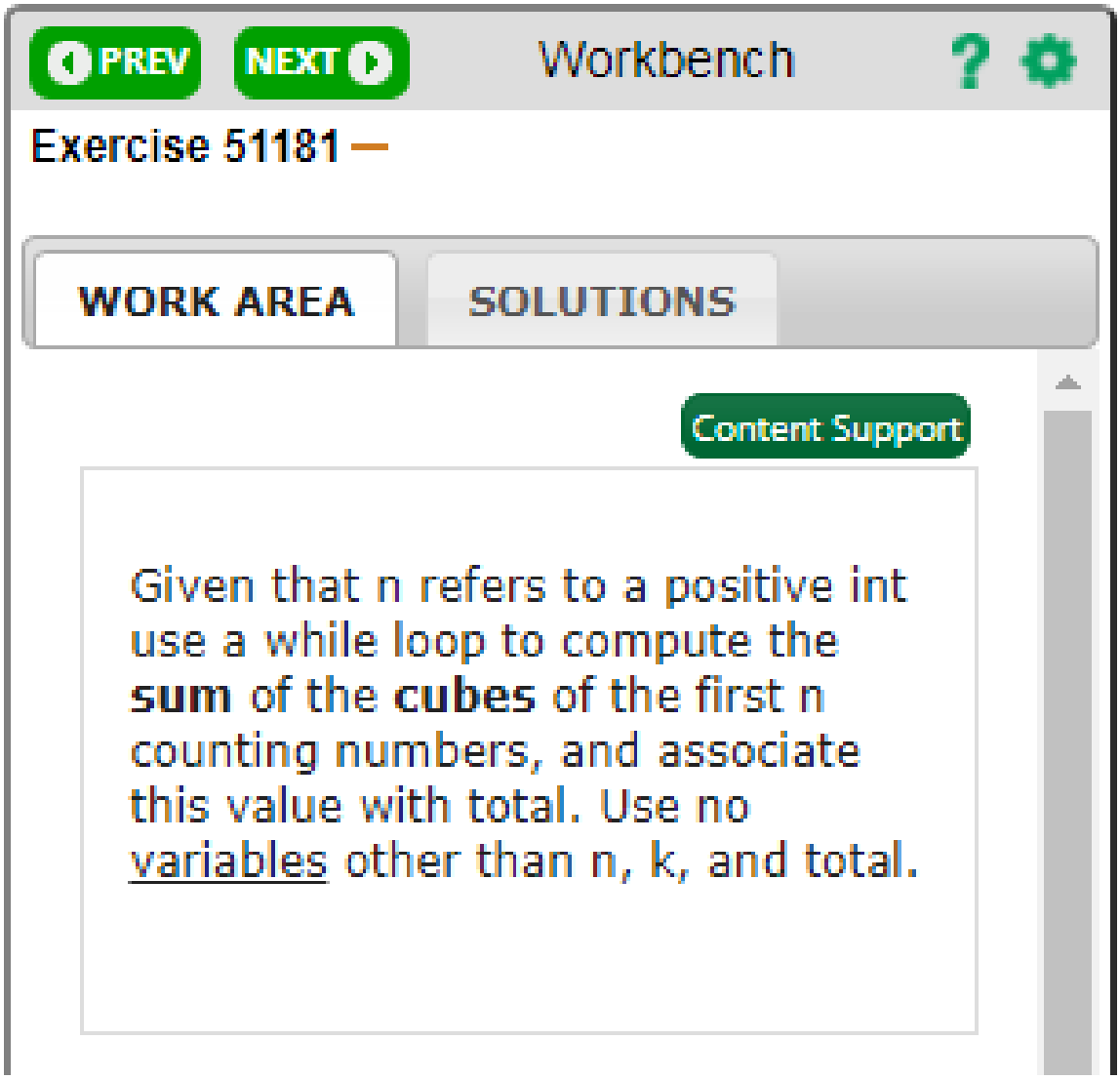

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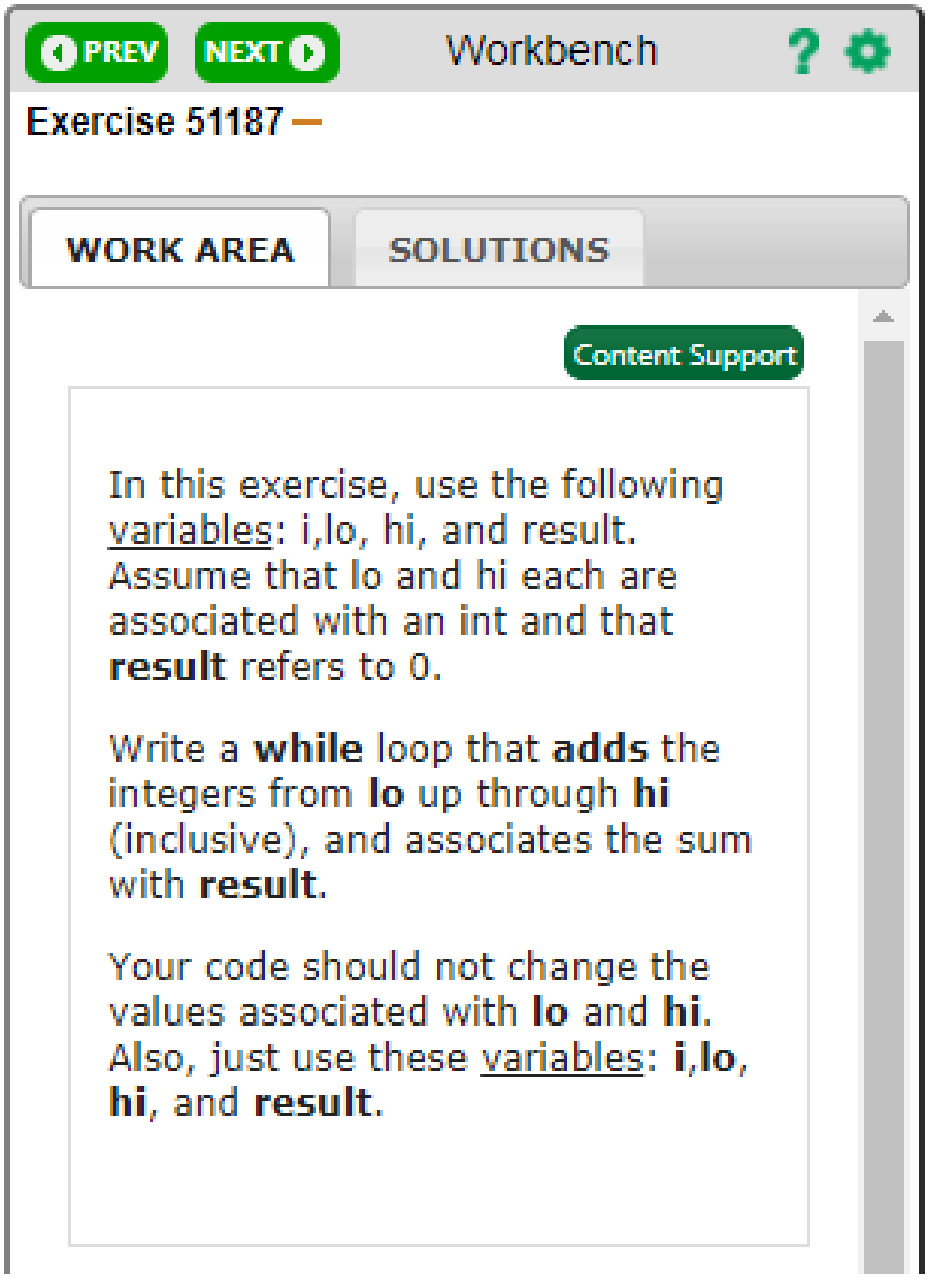

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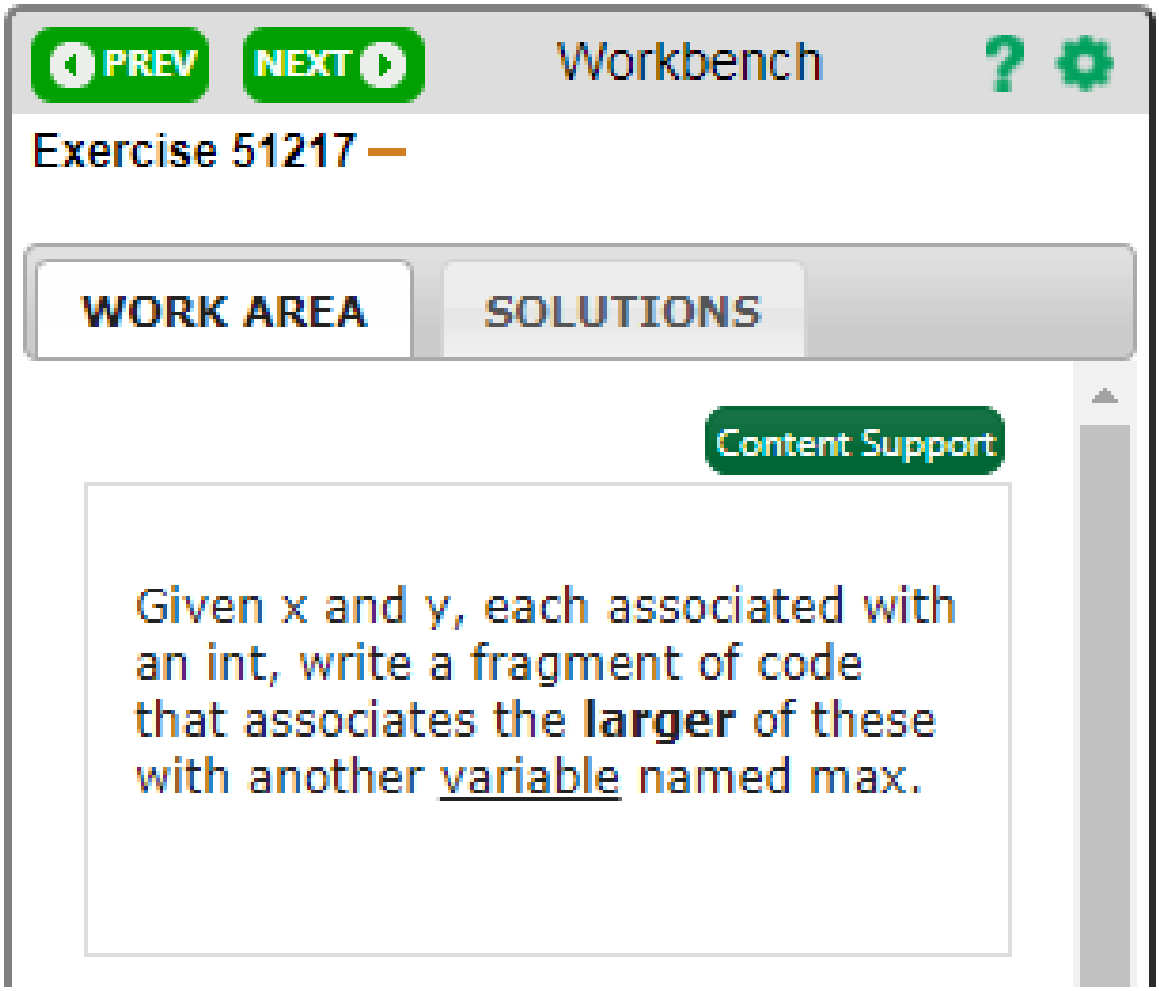

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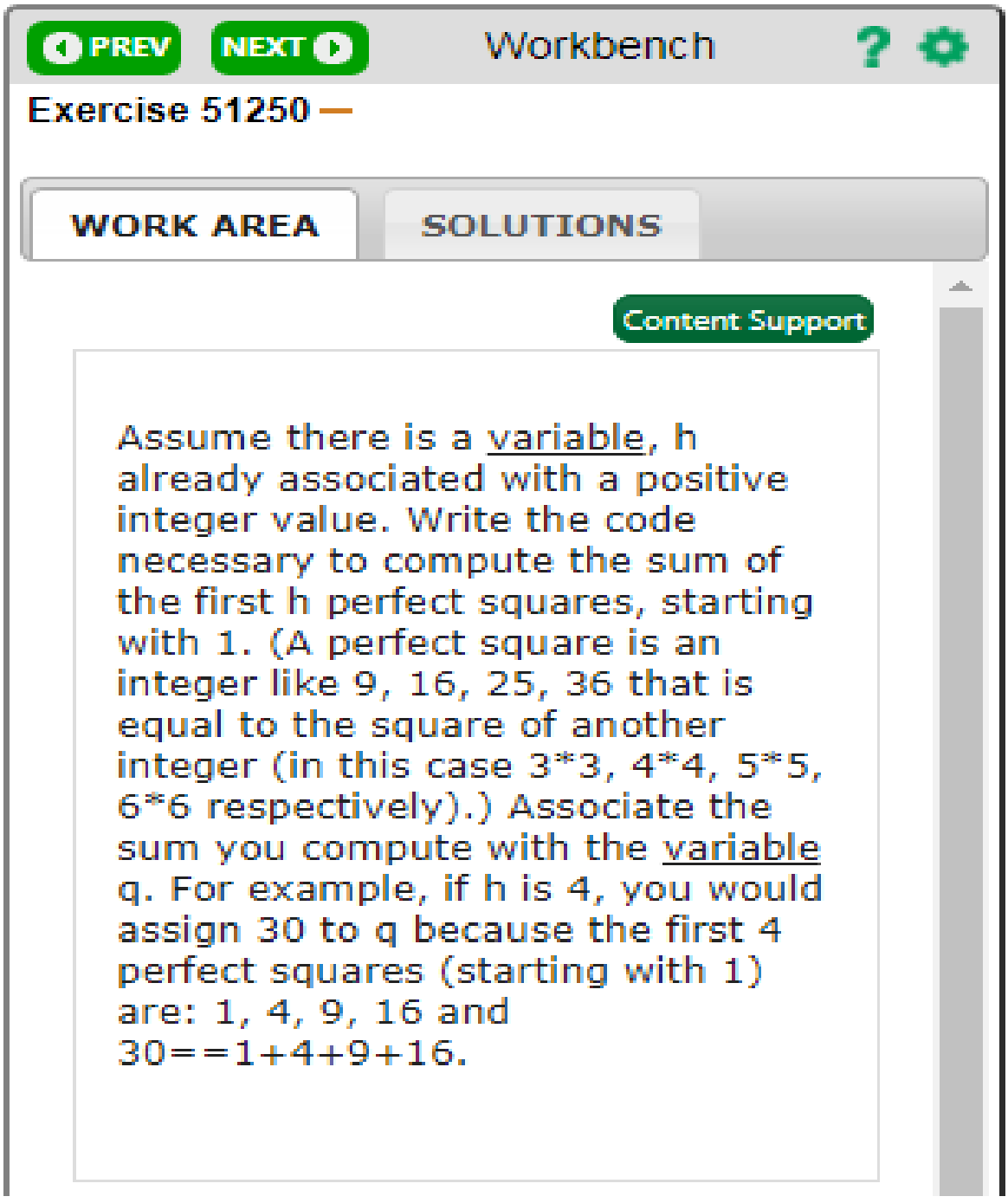

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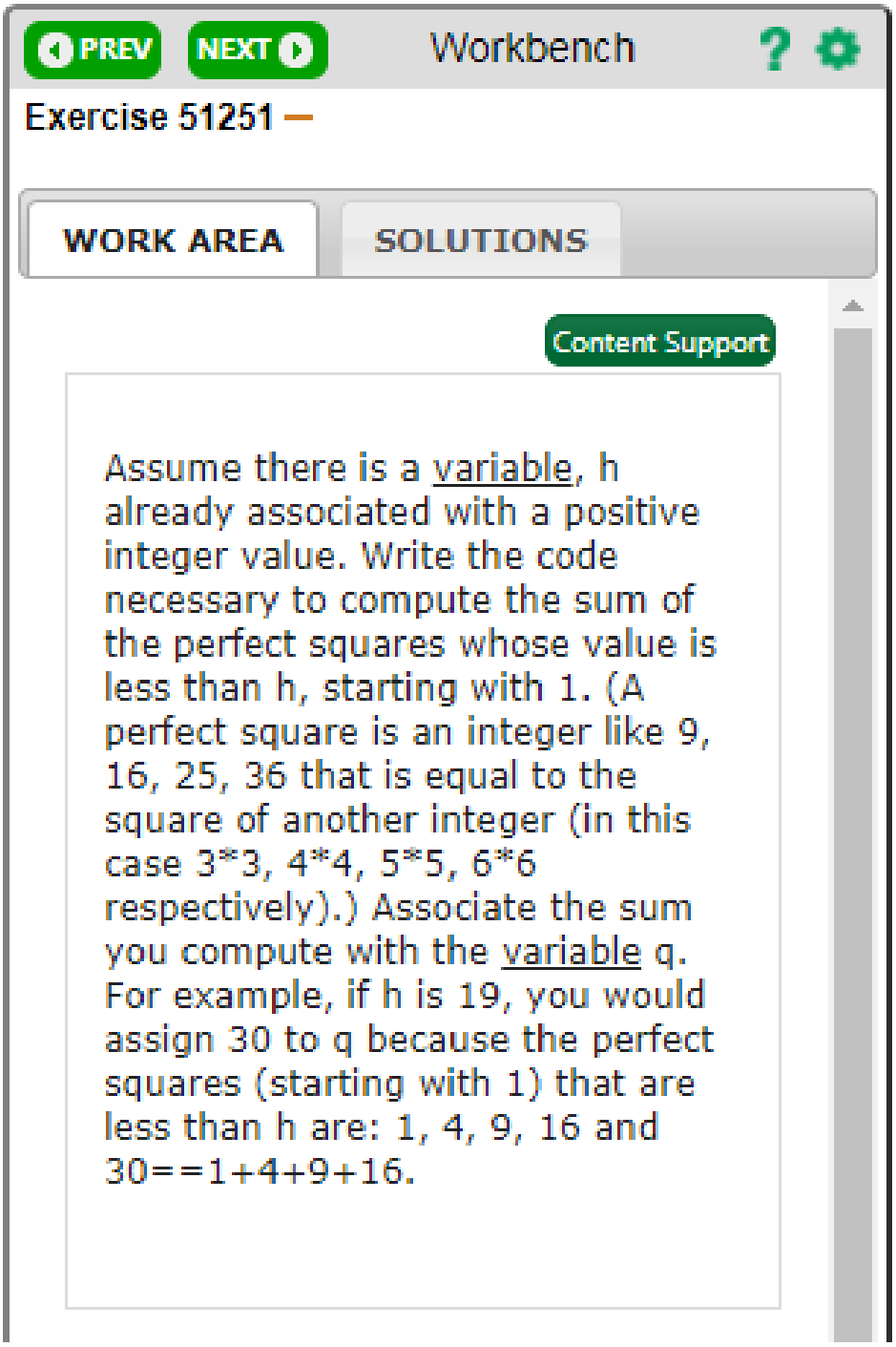

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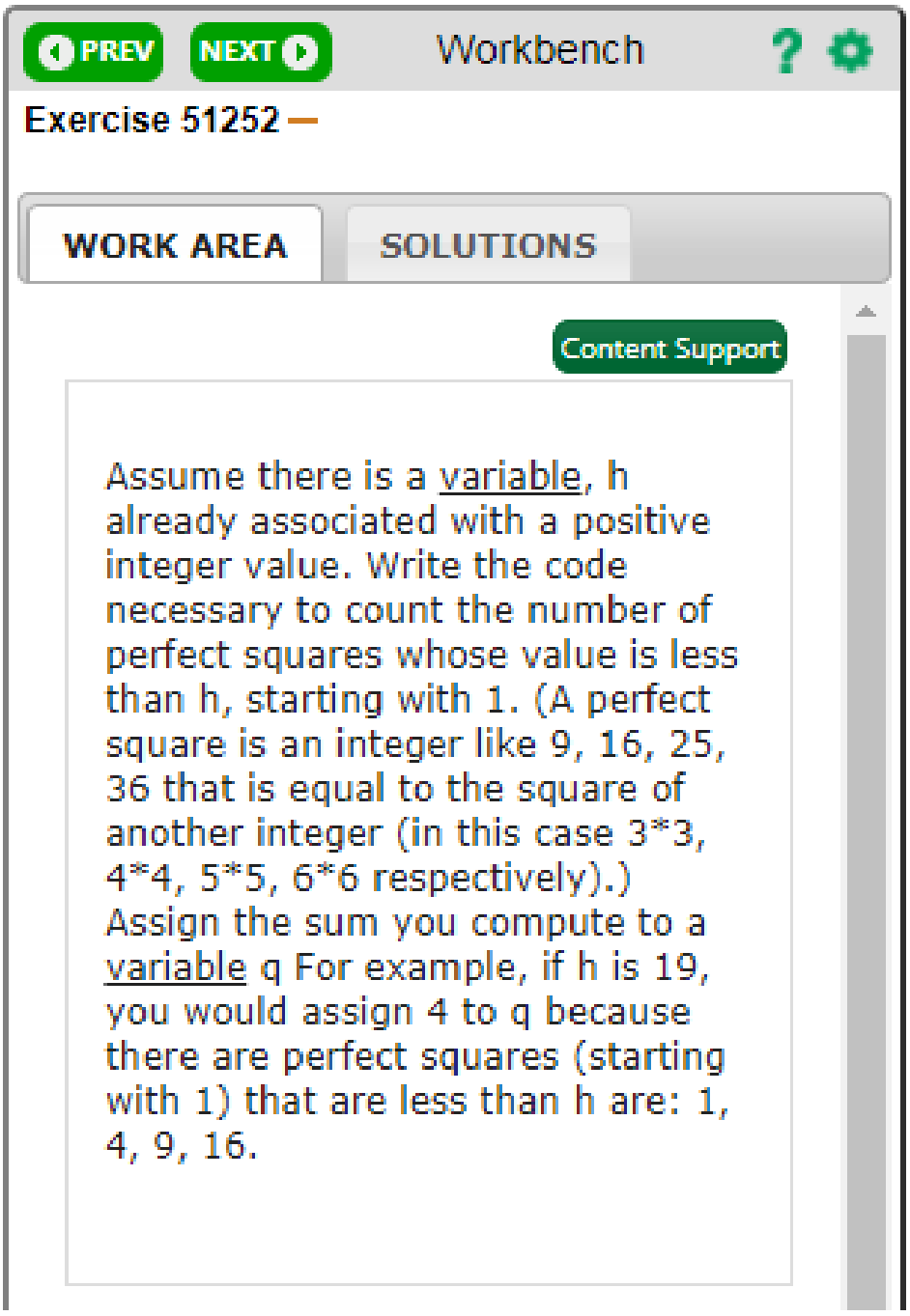

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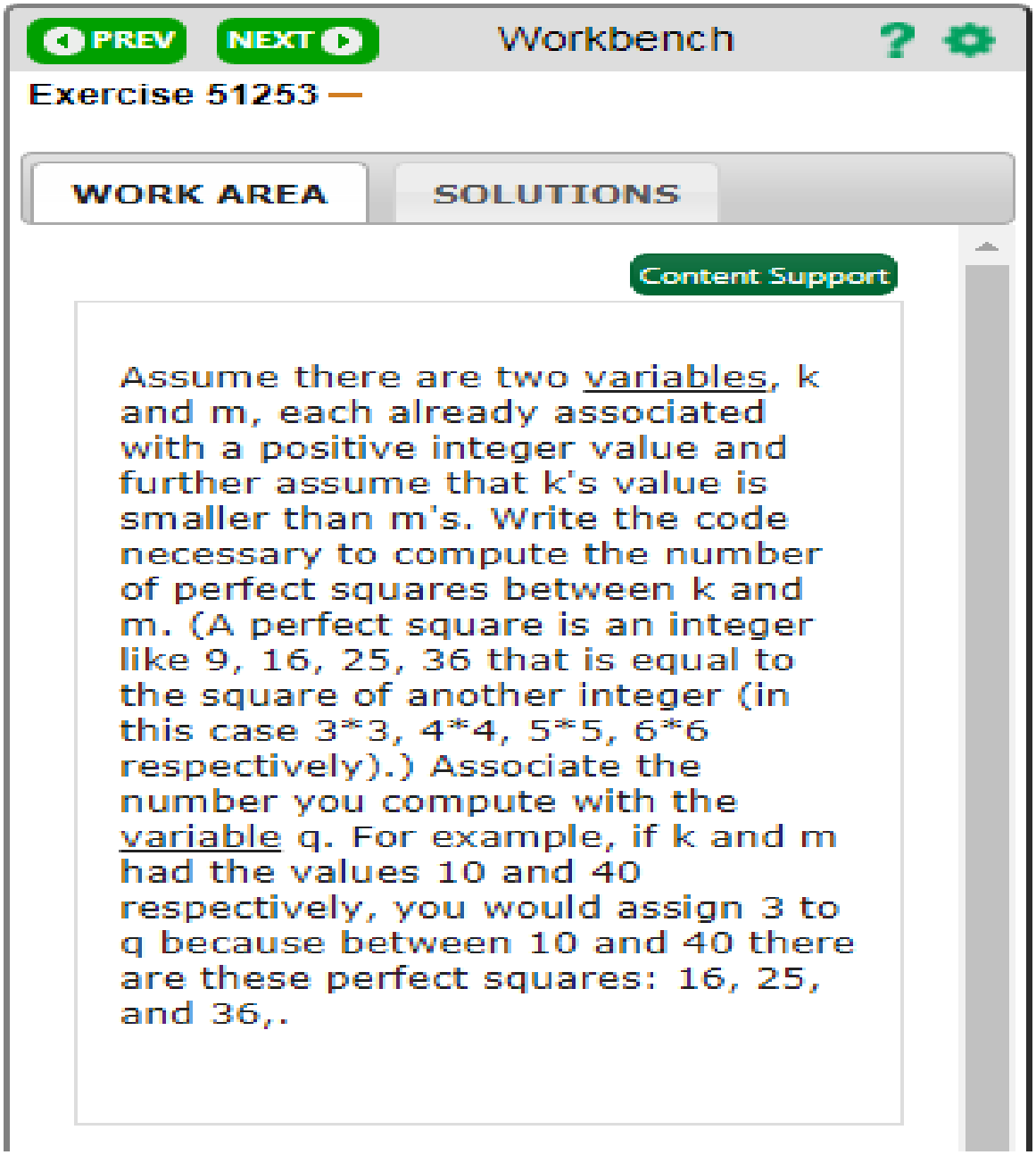

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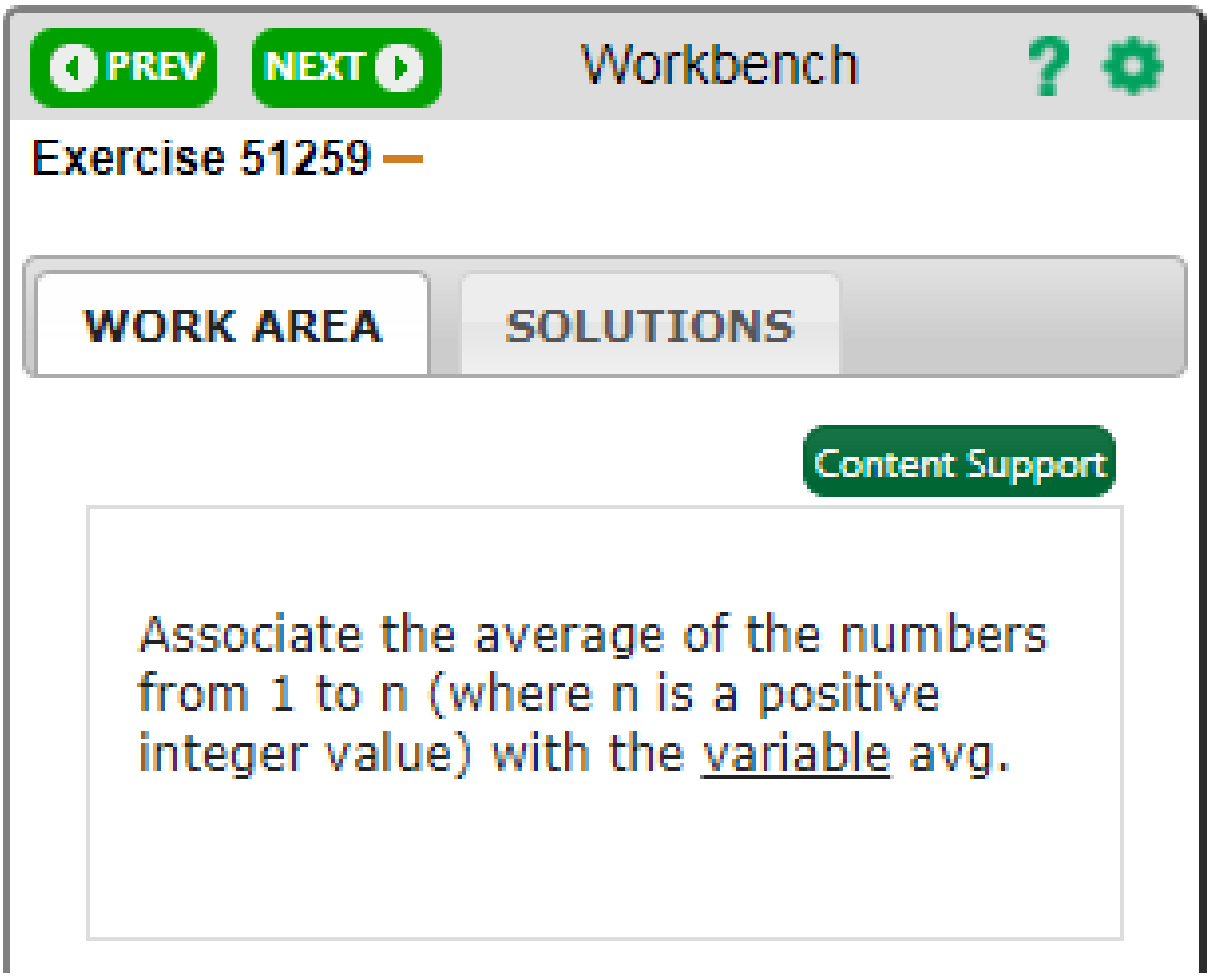

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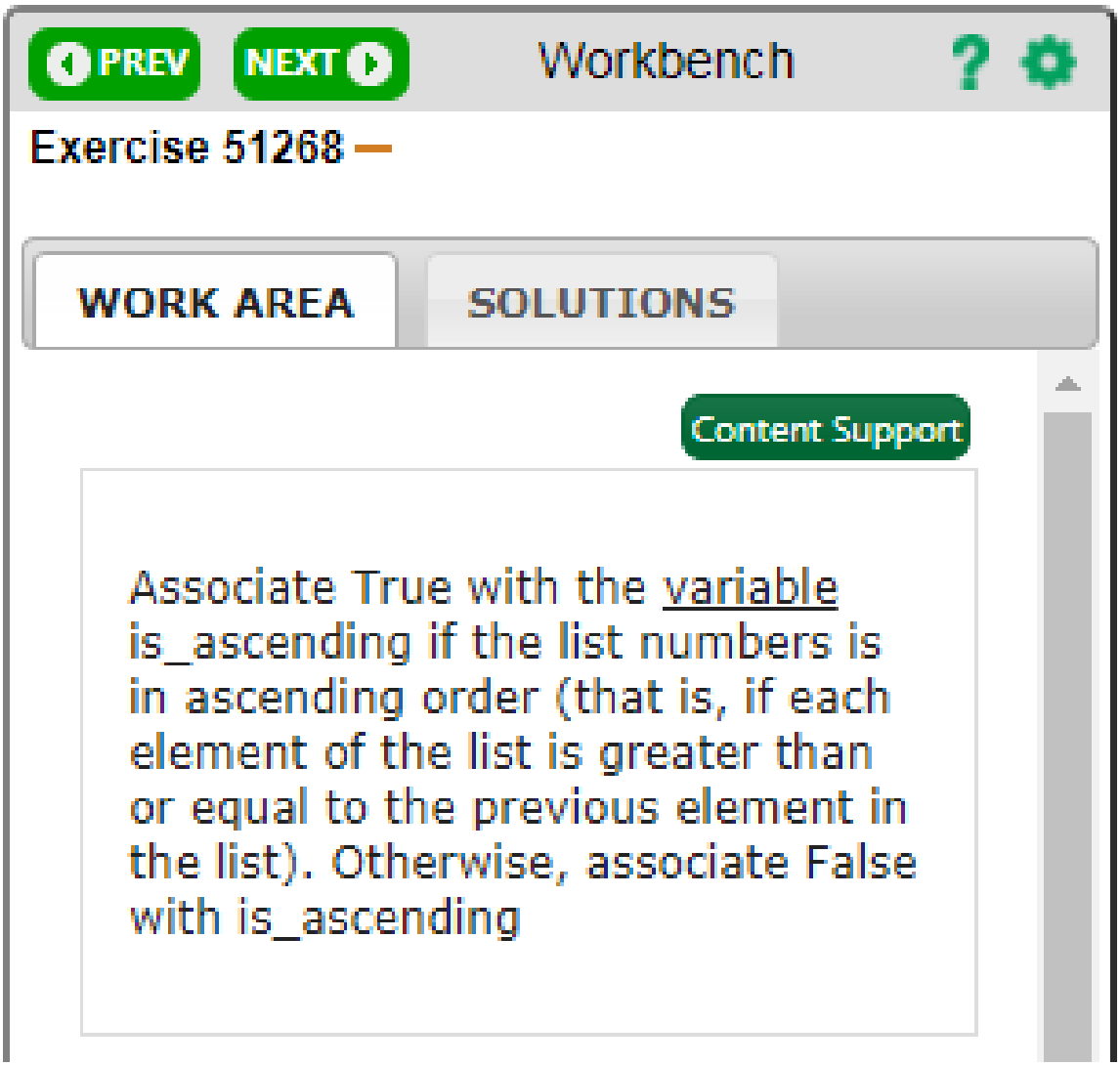

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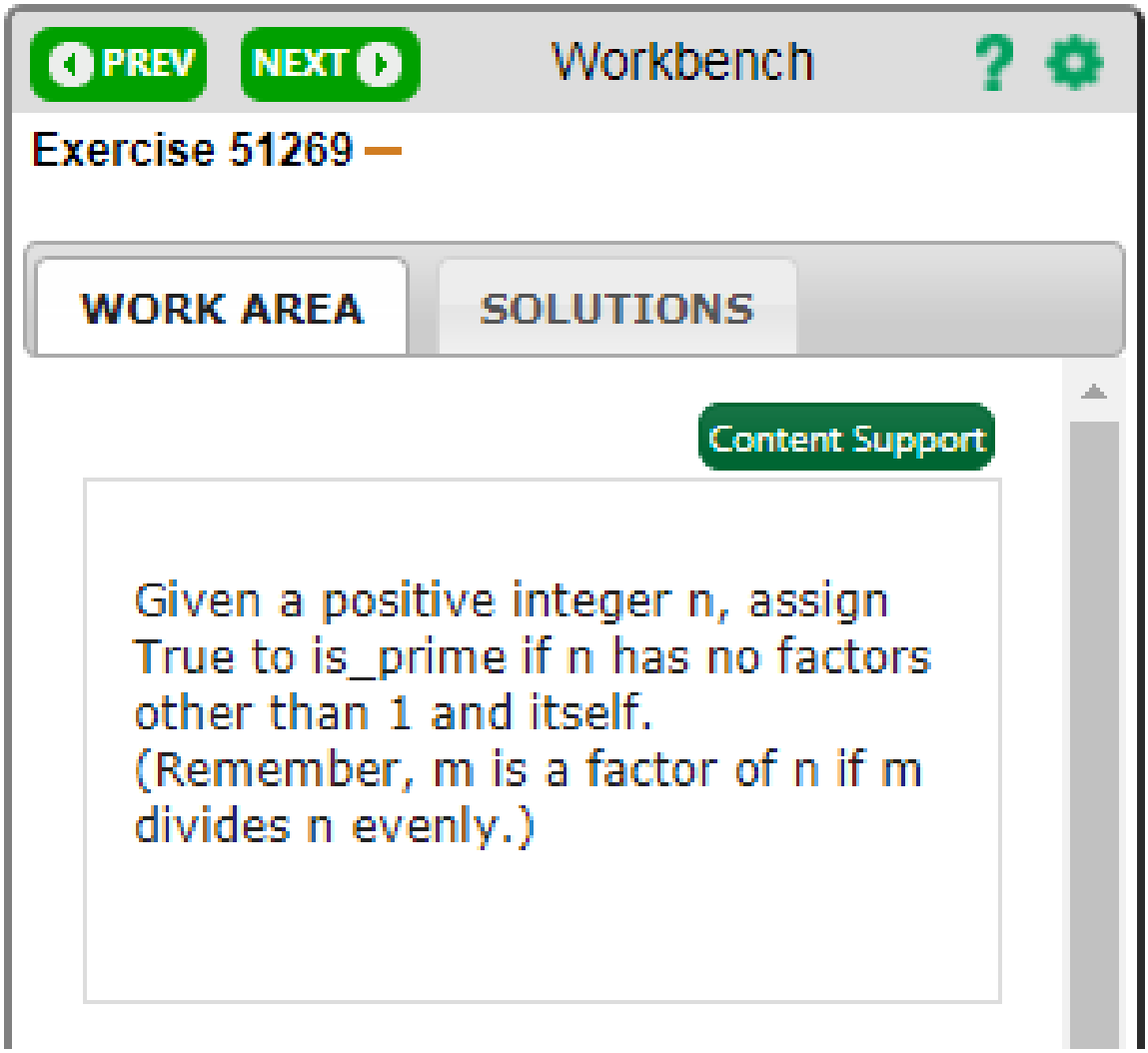

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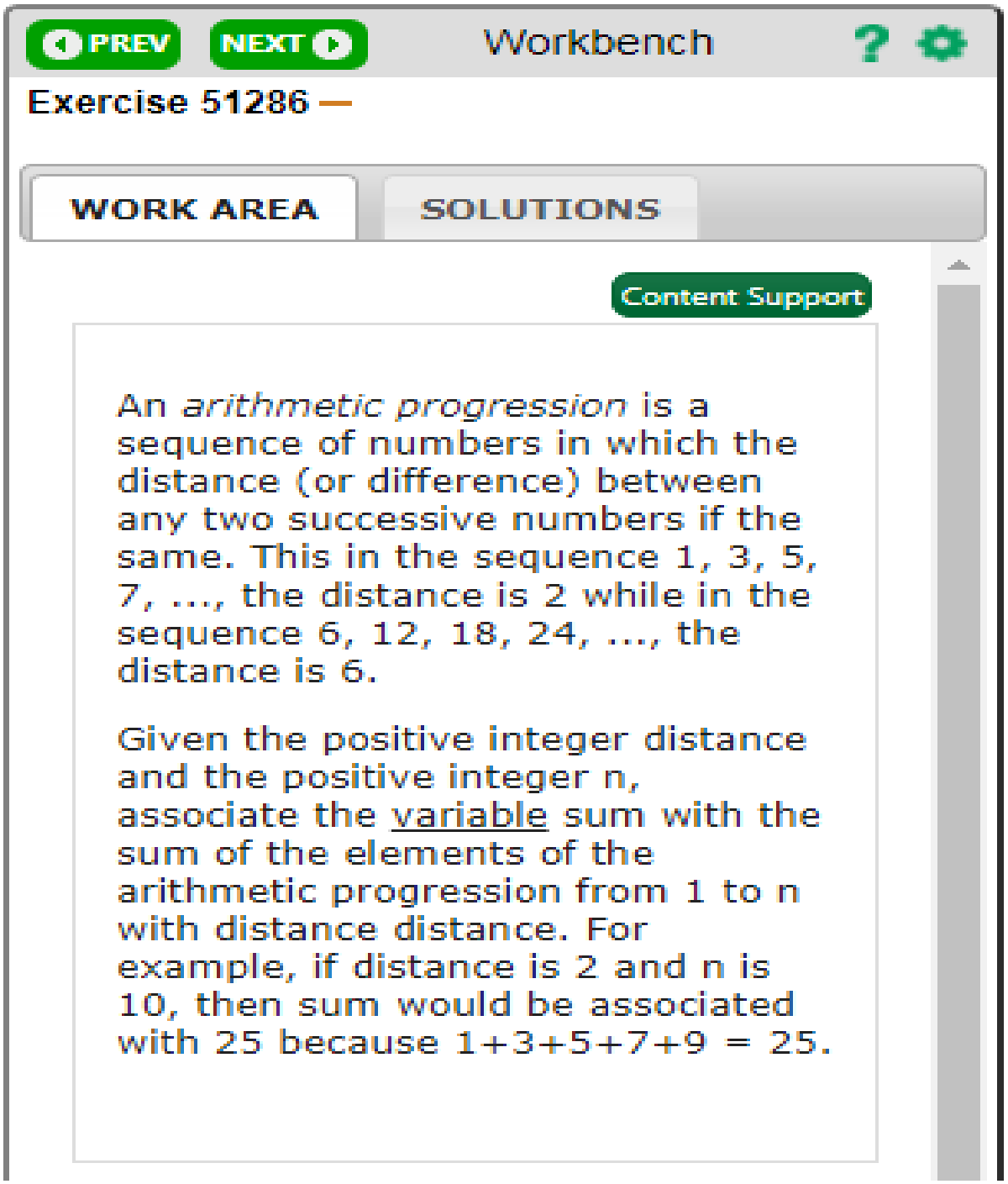

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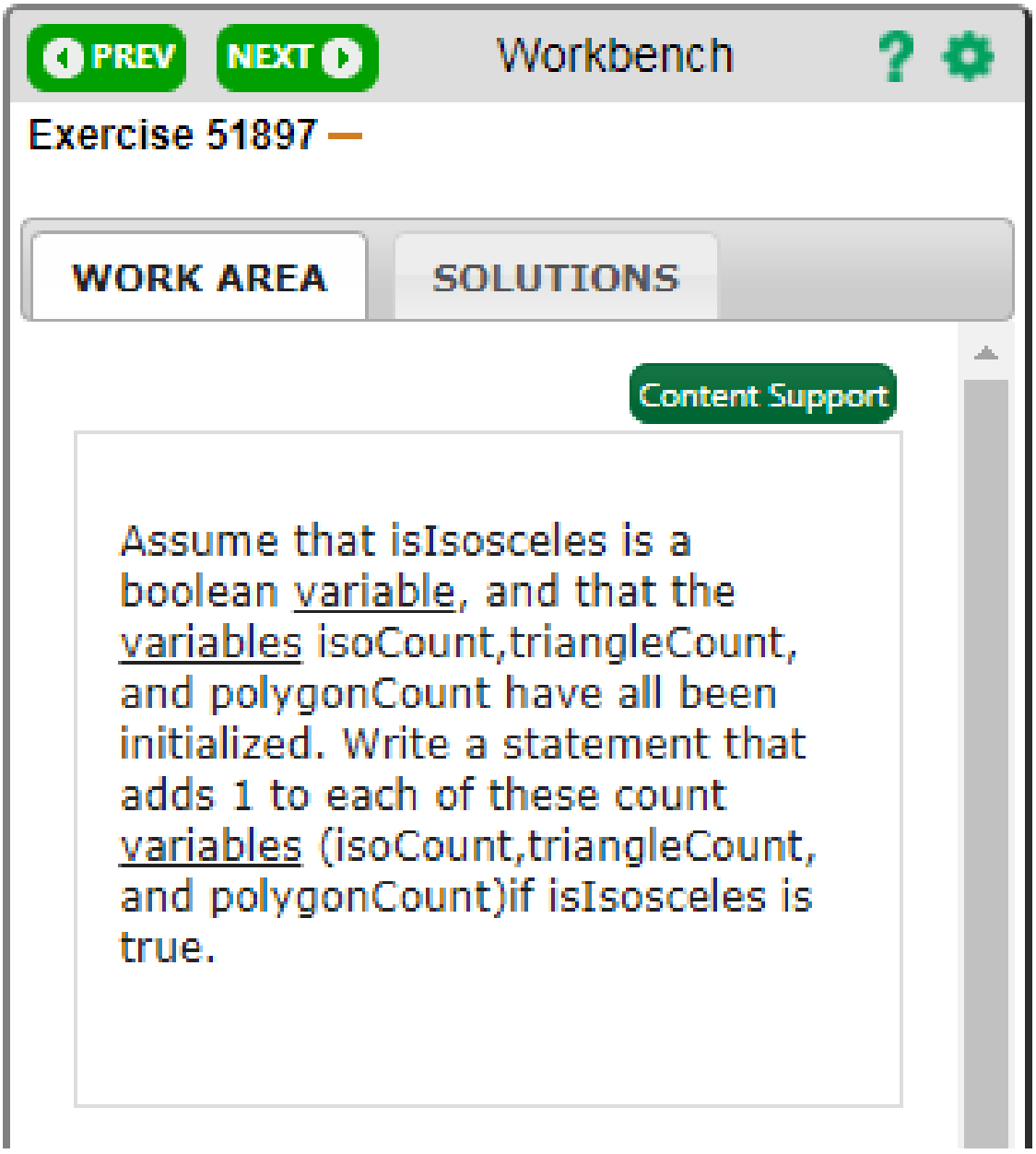

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