Example: For the functions f(x) = x + 1 and $g(x) = x^2$ compute: $g \circ f(x)$

Example: For the functions f(x) = x + 1 and $g(x) = x^2$ compute: $g \circ f(x)$

• Recall: The composition of functions means:

 $g \circ f(x) = g(f(x))$

Example: For the functions f(x) = x + 1 and $g(x) = x^2$ compute: $g \circ f(x)$

• Recall: The composition of functions means:

 $g \circ f(x) = g(f(x))$

To start, we can replace f(x) = x + 1

Example: For the functions f(x) = x + 1 and $g(x) = x^2$ compute: $g \circ f(x)$

• Recall: The composition of functions means:

$$g \circ f(x) = g(f(x)) = g(x+1)$$

To start, we can replace f(x) = x + 1

Example: For the functions f(x) = x + 1 and $g(x) = x^2$ compute: $g \circ f(x)$

• Recall: The composition of functions means:

$$g \circ f(x) = g(f(x)) = g(x+1)$$

To start, we can replace f(x) = x + 1

The function g is the squaring function, that squares its input

Example: For the functions f(x) = x + 1 and $g(x) = x^2$ compute: $g \circ f(x)$

• Recall: The composition of functions means:

 $g \circ f(x) = g(f(x)) = g(x+1)$

To start, we can replace f(x) = x + 1

The function g is the squaring function, that squares its input The input of g here is f(x) = x + 1

Example: For the functions f(x) = x + 1 and $g(x) = x^2$ compute: $g \circ f(x)$

• Recall: The composition of functions means:

 $g \circ f(x) = g(f(x)) = g(x + 1) = (x + 1)^2$ To start, we can replace f(x) = x + 1The function g is the squaring function, that squares its input The input of g here is f(x) = x + 1So, g squares its input f(x) = x + 1

Example: For the functions f(x) = x + 1 and $g(x) = x^2$ compute: $g \circ f(x)$

• Recall: The composition of functions means:

 $g \circ f(x) = g(f(x)) = g(x + 1) = (x + 1)^2$ To start, we can replace f(x) = x + 1The function g is the squaring function, that squares its input The input of g here is f(x) = x + 1So, g squares its input f(x) = x + 1**Conclusion:**

 $g \circ f(x) = (x+1)^2$

Example: For the functions f(x) = x + 1 and $g(x) = x^2$ compute: $g \circ f(x)$

• Recall: The composition of functions means:

 $g \circ f(x) = g(f(x)) = g(x+1) = (x+1)^2$ To start, we can replace f(x) = x + 1The function g is the squaring function, that squares its input The input of g here is f(x) = x + 1So, g squares its input f(x) = x + 1**Conclusion:**

 $g \circ f(x) = (x+1)^2$

Example: For the functions f(x) = x + 1 and $g(x) = x^2$ compute: $g \circ f(x)$

• Recall: The composition of functions means:

 $g \circ f(x) = g(f(x)) = g(x+1) = (x+1)^2$ To start, we can replace f(x) = x + 1The function g is the squaring function, that squares its input The input of g here is f(x) = x + 1

So, g squares its input f(x) = x + 1

Conclusion:

 $g \circ f(x) = (x+1)^2$

If we would like, we can multiply this out to get:

 $(x+1)^2 = (x+1)(x+1)$

Example: For the functions f(x) = x + 1 and $g(x) = x^2$ compute: $g \circ f(x)$

• Recall: The composition of functions means:

 $g \circ f(x) = g(f(x)) = g(x+1) = (x+1)^2$ To start, we can replace f(x) = x + 1The function g is the squaring function, that squares its input

The input of g here is f(x) = x + 1

So, g squares its input f(x) = x + 1

Conclusion:

 $g \circ f(x) = (x+1)^2$

$$(x+1)^2 = (x+1)(x+1)$$

= x²

Example: For the functions f(x) = x + 1 and $g(x) = x^2$ compute: $g \circ f(x)$

• Recall: The composition of functions means:

 $g \circ f(x) = g(f(x)) = g(x+1) = (x+1)^2$ To start, we can replace f(x) = x + 1The function g is the squaring function, that squares its input

The input of g here is f(x) = x + 1

So, g squares its input f(x) = x + 1

Conclusion:

 $g \circ f(x) = (x+1)^2$

$$(x+1)^2 = (x+1)(x+1)$$

= $x^2 + x$

Example: For the functions f(x) = x + 1 and $g(x) = x^2$ compute: $g \circ f(x)$

• Recall: The composition of functions means:

 $g \circ f(x) = g(f(x)) = g(x+1) = (x+1)^2$ To start, we can replace f(x) = x + 1The function g is the squaring function, that squares its input The input of g here is f(y) = x + 1

The input of g here is f(x) = x + 1

So, g squares its input f(x) = x + 1

Conclusion:

 $g \circ f(x) = (x+1)^2$

$$(x+1)^2 = (x+1)(x+1)$$

= $x^2 + x + x$

Example: For the functions f(x) = x + 1 and $g(x) = x^2$ compute: $g \circ f(x)$

• Recall: The composition of functions means:

 $g \circ f(x) = g(f(x)) = g(x+1) = (x+1)^2$ To start, we can replace f(x) = x + 1The function g is the squaring function, that squares its input

The input of g here is f(x) = x + 1

So, g squares its input f(x) = x + 1

Conclusion:

 $g \circ f(x) = (x+1)^2$

$$(x + 1)^2 = (x + 1)(x + 1)$$

= $x^2 + x + x + 1$

Example: For the functions f(x) = x + 1 and $g(x) = x^2$ compute: $g \circ f(x)$

• Recall: The composition of functions means:

 $g \circ f(x) = g(f(x)) = g(x+1) = (x+1)^2$ To start, we can replace f(x) = x+1

The function g is the squaring function, that squares its input The input of g here is f(x) = x + 1So, g squares its input f(x) = x + 1

Conclusion:

 $g \circ f(x) = (x+1)^2$

If we would like, we can multiply this out to get:

$$(x + 1)^2 = (x + 1)(x + 1)$$

= $x^2 + x + x + 1$

Alternate Conclusion:

$$\mathbf{g} \circ \mathbf{f}(x) = x^2 + 2x + 1$$