Topic: Sum of functions

Question: Find the sum of the functions.

Find $(g + h)(4)$ if

$$g(x) = x^2 - 3x + 1$$

$$h(x) = x + 3$$

Answer choices:

A $(g + h)(4) = 6$

B $(g + h)(4) = 8$

C $(g + h)(4) = 10$

D $(g + h)(4) = 12$

Solution: D

We need to find

$$(g + h)(4)$$

which we could rewrite as

$$g(4) + h(4)$$

This function notation tells us that we need to evaluate each of the functions at $x = 4$, and then add the results.

For $g(4)$:

$$g(x) = x^2 - 3x + 1$$

$$g(4) = (4)^2 - 3(4) + 1$$

$$g(4) = 16 - 12 + 1$$

$$g(4) = 4 + 1$$

$$g(4) = 5$$

For $h(4)$:

$$h(x) = x + 3$$

$$h(4) = 4 + 3$$

$$h(4) = 7$$

Now we can use

$$(g+h)(4) = g(4) + h(4)$$

$$(g+h)(4) = 5 + 7$$

$$(g+h)(4) = 12$$

We could also have added the expressions for the functions, and then plugged in 4 for x to get the answer.

$$(g+h)(x) = \left(x^2 - 3x + 1\right) + (x+3)$$

$$(g+h)(x) = x^2 - 3x + 1 + x + 3$$

$$(g+h)(x) = x^2 - 2x + 4$$

$$(g+h)(4) = (4)^2 - 2(4) + 4$$

$$(g+h)(4) = 16 - 8 + 4$$

$$(g+h)(4) = 8 + 4$$

$$(g+h)(4) = 12$$

Topic: Sum of functions

Question: If $f(x) = x^2 + 4x$ and $g(x) = -x + 2$, find $(f + g)(4)$.

Answer choices:

A 26

B 30

C 34

D 38

Solution: B

We know that

$$(f+g)(x) = f(x) + g(x)$$

Substituting the given expression for each function gives

$$(f+g)(x) = x^2 + 4x + (-x + 2)$$

$$(f+g)(x) = x^2 + 4x - x + 2$$

$$(f+g)(x) = x^2 + 3x + 2$$

Substituting 4 for x gives

$$(f+g)(4) = 4^2 + 3(4) + 2$$

$$(f+g)(4) = 16 + 12 + 2$$

$$(f+g)(4) = 28 + 2$$

$$(f+g)(4) = 30$$

Topic: Sum of functions

Question: If $h(x) = (x-3)^2$ and $j(x) = \sqrt{x^2+16}$, find $(h+j)(3)$.

Answer choices:

A 5

B 18

C 31

D 36

Solution: A

We know that

$$(h+j)(x) = h(x) + j(x)$$

Substituting the given expression for each function gives

$$(h+j)(x) = (x-3)^2 + \sqrt{x^2+16}$$

$$(h+j)(x) = x^2 - 3x - 3x + 9 + \sqrt{x^2+16}$$

$$(h+j)(x) = x^2 - 6x + 9 + \sqrt{x^2+16}$$

You can't simplify this, so go ahead and substitute 3 for x.

$$(h+j)(3) = 3^2 - 6(3) + 9 + \sqrt{3^2+16}$$

$$(h+j)(3) = 9 - 18 + 9 + \sqrt{9+16}$$

$$(h+j)(3) = 0 + \sqrt{25}$$

$$(h+j)(3) = 5$$