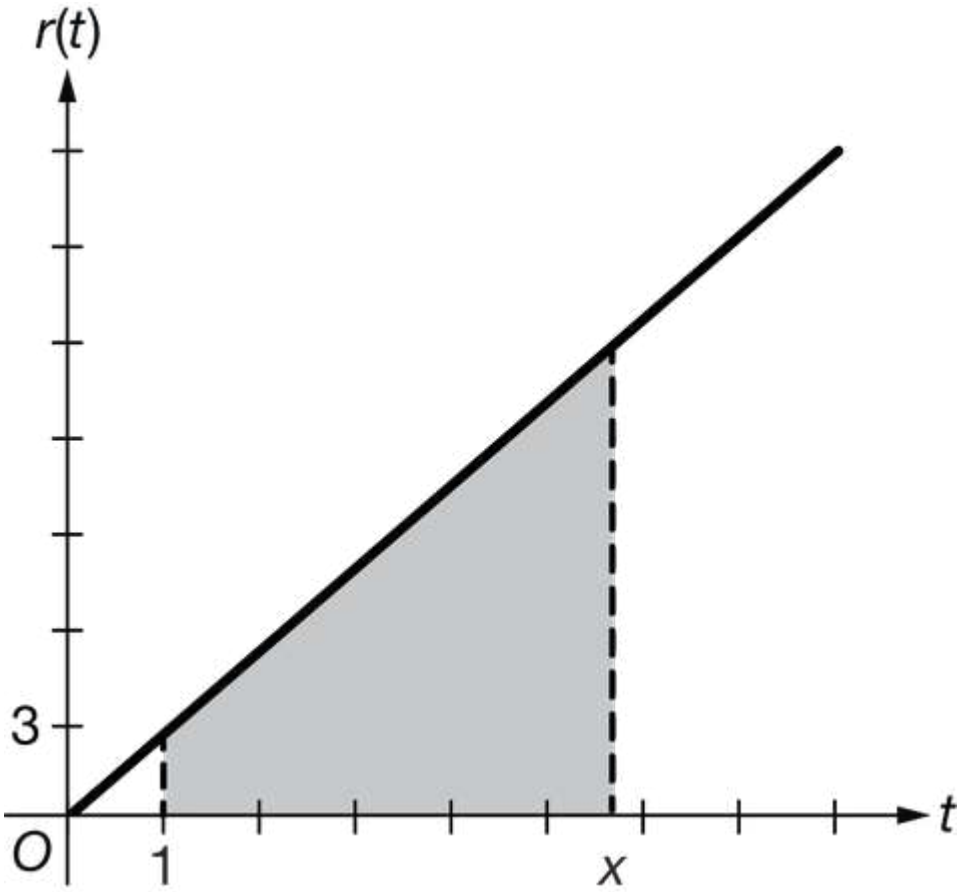
Quiz 6.4

Name

1.



A pump allows water to flow into a tank at the rate of $r(t) = 3t$ liters per minute, where t is the time in minutes since the pump was turned on. Which of the following defines a function that measures the accumulation of water in the tank during the time period from $t = 1$ to $t = x$ as the variable x moves along the t-axis as shown in the figure above?

(A) $f(x) = 3x$

(B) $f(x) = 1 + 3x$

(C) $f(x) = \int_0^x 3t\,dt$

(D) $f(x) = \int_1^x 3t\,dt$

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2.

x	1	2
$f(x)$	2	3
$g(x)$	-4	-2
$g'(x)$	-3	4

Let f be the function given by $f(x) = \int_{-2}^{x} g(t)\,dt$, where g is a differentiable function. The table above gives selected values for f, g, and g'. If h is the function given by $h(x) = 2x + \sin x$, for what value of x is $h(x) = f'(2)$?

(A) -0.684

(B) 0.335

(C) 1.063

(D) 1.501

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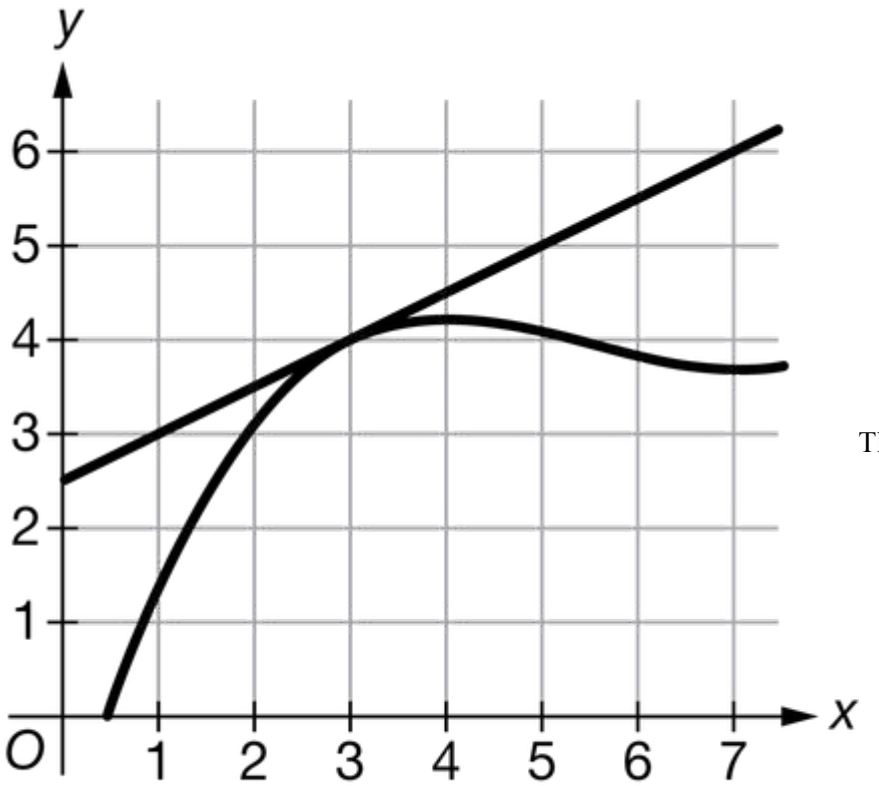
3.



Graph of g

The figure above shows the graph of the differentiable function g and the line tangent to the graph of g at the point $(3, 4)$. Let f be the function given by $f(x) = \int_0^x g(t)\,dt$. Let h be the function with first derivative given by $h'(x) = xe^{\cos x}$ for $0 < x < 7$. If the line tangent to the graph of h at $x = a$ is parallel to the line tangent to the graph of f at $x = 3$, what is the value of a ?

(A) 0.187

(B) 1.115

(C) 4.335

(D) 4.577