

## Quiz 6

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Suppose the functions  $f(x)$  and  $g(x)$  satisfy  $f(2) = 3$ ,  $f'(2) = 2$ ,  $g(2) = -6$ , and  $g'(2) = 5$ . Let  $H(x) = f(x) \cdot g(x)$ .

1. Find  $H'(2)$ .

**Solution:** Use the product rule to get  $H'(x) = f'(x)g(x) + g'(x)f(x)$ , so  $H'(2) = f'(2)g(2) + g'(2)f(2) = 2(-6) + 5 \cdot 3 = 3$ .

2. Use the information in 1. to find an equation for the line tangent to the graph of  $H(x)$  at the point  $(2, H(2))$ .

**Solution:** Note that  $H(2) = f(2) \cdot g(2) = 3(-6) = -18$  so the line in question has equation  $y + 18 = 3(x - 2) = 3x - 6$ . In slope-intercept form this is  $y = 3x - 24$ .