Find the derivative of the following functions:

deriv of first ↓   deriv of second ↓

then $f'(x) = (2x - \frac{1}{2}x^{-1/2})3^x + (x^2 - x^{1/2})\ln(3)3^x$

1. $f(x) = (x^2 - \sqrt{x})3^x$ $= (x^2 - x^{1/2})3^x$

deriv of top ↙   deriv of bottom ↙

2. $f(x) = \frac{17e^x}{2^x}$ then $f'(x) = \dfrac{17e^x \cdot 2^x - 17e^x \ln(2)2^x}{(2^x)^2}$

3. $f(x) = \frac{4}{3+\sqrt{x}}$ then $f'(x) = \dfrac{(0)(3+\sqrt{x}) - 4(\frac{1}{2}x^{-1/2})}{(3+\sqrt{x})^2} = \dfrac{-2/\sqrt{x}}{(3+\sqrt{x})^2}$

simplify!

4. $f(x) = \frac{x^2+3x+1}{\sqrt{x}}$ $= x^{3/2} + 3x^{1/2} + x^{-1/2}$

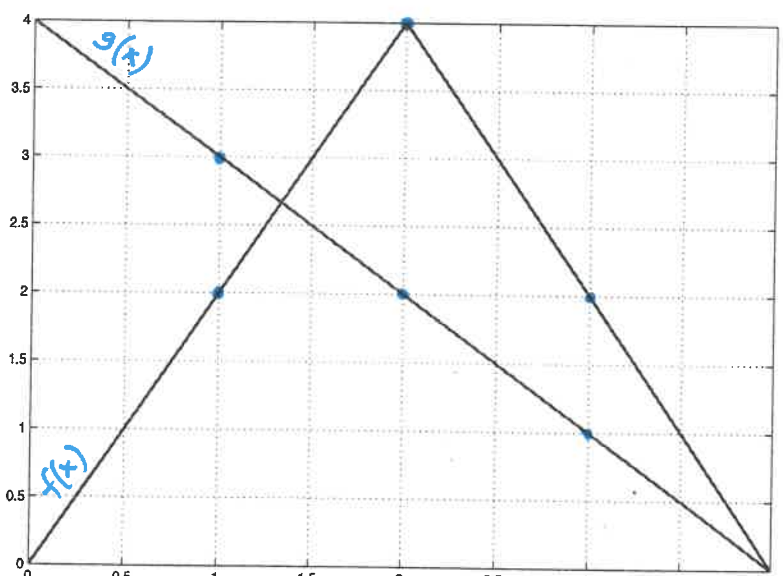
then $f'(x) = \frac{3}{2}x^{1/2} + \frac{3}{2}x^{-1/2} - \frac{1}{2}x^{-3/2}$

If $h(x) = f(x)g(x)$, from looking at the figure below, and using the product rule, find:

$h'(1)$, $h'(2)$, and $h'(3)$.

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

use this



find values from the graph.

SLOPE   y-val   y-val   slope

$h'(1) = f'(1)g(1) + f(1)g'(1) = (2)\cdot(3) + (2)\cdot(-1) = 6 - 2 = 4$

$h'(2) = f'(2)g(2) + f(2)g'(2) =$ problem! $f'(2)$ DNE so $h'(2)$ DNE!

$h'(3) = f'(3)g(3) + f(3)g'(3) = (-2)(1) + (2)(-1) = -2 - 2 = -4.$