

3. [12 points]

Use the information in the table below to answer (a) - (c):

x	-3	-2	-1	0	1	2	3
$f(x)$	1	3	2	-1	-3	-2	0
$f'(x)$	3	2	-2	-3	-1	1	2
$g(x)$	2	3	1	2	4	3	1
$g'(x)$	1	-2	2	3	-1	0	-3

a. [4 points] If $h(x) = g(f(e^\pi \ln x))$, find $h'(1)$. (Give an exact answer.)

b. [4 points] If $j(x) = \sin^2\left(\frac{3f(x)}{2}\right)$, find $j'(-2)$. (Give an exact answer.)

c. [4 points] Give an exact answer for $\int_{-3}^2 \frac{f'(x)g(x) - f(x)g'(x)}{(g(x))^2} dx$, assuming $g(x) \neq 0$.