3. [15 points] Use the graphs of $f(x)$ and $g(x)$ to find the EXACT values of $A,B,$ and C. Show all your work.
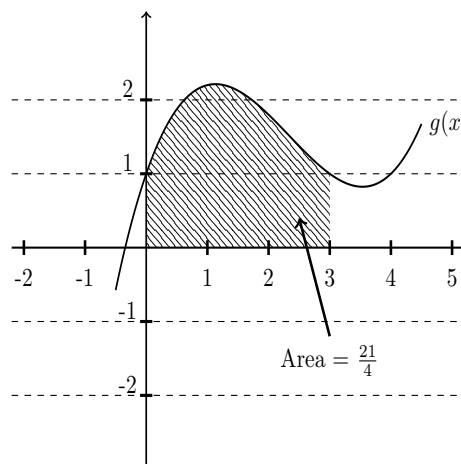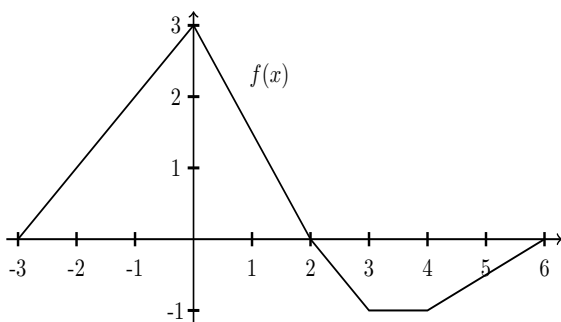

a. [2 points] $A = \int_{-3}^{6} |f(x)| dx$

> *Solution:* $A = \frac{15}{2} + \frac{5}{2} = 10$

b. [5 points] $B = \int_{0}^{2} x g'(x^2) dx$

> *Solution:* Using $u = x^2$
> $B = \frac{1}{2} \int_{0}^{4} g'(u) du = \frac{1}{2} (g(4) - g(0)) = 0$

c. [8 points] $C = \int_{0}^{3} 2x g'(x) dx$

> *Solution:* Using integration by parts $C = 2xg(x)\big|_{0}^{3} - 2 \int_{0}^{3} g(x) dx = 6 - 2\left(\frac{21}{4}\right) = -\frac{9}{2}$