

3. $g(x) = \int_0^x f(t) dt$

a) $g(0) = \int_0^0 f(t) dt = 0$

$g(1) = \int_0^1 f(t) dt = 2$

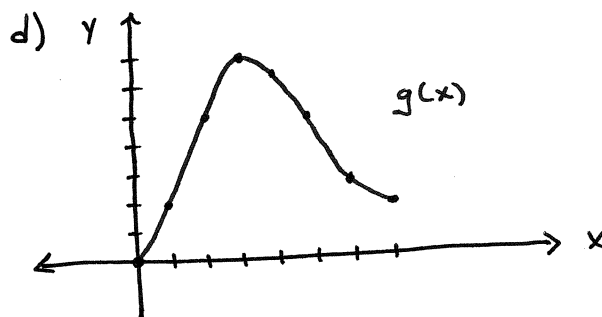
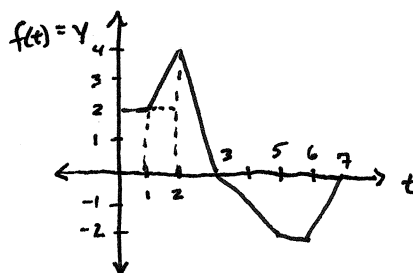
$g(2) = \int_0^2 f(t) dt = 5$

$g(3) = \int_0^3 f(t) dt = 7$

$g(6) = \int_0^6 f(t) dt = 7 - 4 = 3$

b) g increasing: $(0, 3)$

c) max of $g(x)$ at $x=3$



8. $g(x) = \int_1^x \ln t dt$

$g'(x) = \ln x$

10. $F(x) = \int_x^{10} \tan \theta d\theta = -\int_{10}^x \tan \theta d\theta$

$F'(x) = -\tan x$

12. $h(x) = \int_0^{x^2} \sqrt{1+r^3} dr$

$h'(x) = 2x\sqrt{1+x^6}$

15. $g(x) = \int_{2x}^{3x} \frac{u^2-1}{u^2+1} du$

$g(x) = \int_{2x}^0 \frac{u^2-1}{u^2+1} du + \int_0^{3x} \frac{u^2-1}{u^2+1} du$

$g(x) = -\int_0^{2x} \frac{u^2-1}{u^2+1} du + \int_0^{3x} \frac{u^2-1}{u^2+1} du$

$g'(x) = -2\left(\frac{4x^2-1}{4x^2+1}\right) + 3\left(\frac{9x^2-1}{9x^2+1}\right)$