

1. (a) $\int_0^2 (8x - x^4) dx$
 (b) $\int_0^{16} (y^{\frac{1}{4}} - \frac{1}{8}y) dx$
 (c) $16 - \frac{32}{5} = \frac{48}{5} = 9.6$
2. (a) $\int_0^1 2\pi x(x - x^2) dx$
 (b) $\int_0^1 (9\pi - \pi(3 - x + x^2)^2) dx$
 (c) $\int_0^1 \pi(x - x^2)^2 dx$
3. (a) $W = 9.8 \times 3000 \int_{\frac{1}{4}}^1 x(1 - x) dx$
 (b) $W = 9.8 \times 3000 \times (\frac{1}{2} - \frac{1}{3} - (\frac{1}{32} - \frac{1}{192})) = 9.8 \times 3000 \times \frac{96 - 64 - 6 + 1}{192}$
 $= 9.8 \times 3000 \times \frac{9}{64}$
4. (a) $\frac{-1}{30}(1 - x^3)^{10} + C$
 (b) $\frac{\sqrt{x^2 - 9}}{9x} + C$
 (c) $2\sqrt{1 - \cos(x)} + C$
 (d) $\frac{1}{2}x^2 \ln x - \frac{1}{4}x^2 + C$
 (e) $-(x^2 + 2x + 2)e^{-x}$
 (f) $\frac{1}{3}\sin^3(x) - \frac{1}{5}\sin^5(x)$
5. (a) $\frac{2}{5}(x + 3)^{\frac{5}{2}} - 2(x + 3)^{\frac{3}{2}} \Big|_{-2}^1$
 (b) $-x \cos(x) + \sin(x) \Big|_0^{\pi/2} = 1$