1. (a) $\int_2^0 x\,dx = -\int_0^2 x\,dx = -2$ (b) $\int_4^{-1}(x+1)\,dx = -\int_{-1}^4 (x+1)\,dx = -\frac{1}{2}5^2 = -\frac{25}{2}$

2. (a) $\int_0^1 \sqrt{1-x^2}\,dx = \frac{1}{4}\pi(1)^2 = \frac{1}{4}\pi$ (b) $\int_1^{-1}\sqrt{1-x^2}\,dx = -\int_{-1}^1\sqrt{1-x^2}\,dx = -\frac{1}{2}\pi$

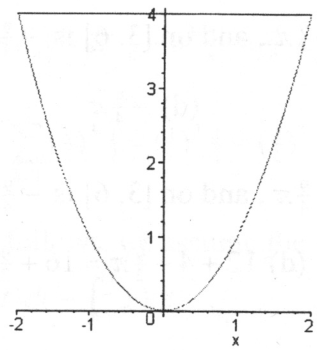
3. (a) *iii* $\int_{-a}^a \frac{1}{1+x^2}dx = 2\int_0^a \frac{1}{1+x^2}dx$ as $\frac{1}{1+x^2}$ is symmetric about y-axis.

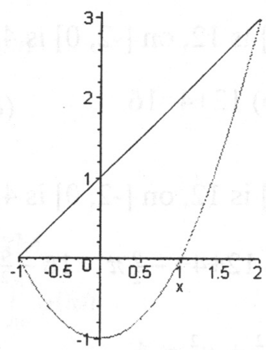
(b) *i* Integrand is odd function so total signed area is zero.

5. (a) $\int_a^b |f(t)|dt \geq \left|\int_a^b f(t)dt\right|$ because all areas for $\int_a^b |f(t)|dt$ are positive while $\left|\int_a^b f(t)dt\right|$ adds signed areas (negative area subtracts from positive area) then takes absolute value.

(b) They will be equal if $f(t) \geq 0$ on [a, b], OR $f(t) \leq 0$ on [a, b].

6. (a) $\int_{-2}^2 (4-x^2)dx$ (b) $\int_{-1}^2 [(x+1)-(x^2-1)]dx$





8. (a) $\int_0^5 7f(t)dt = 7\int_0^5 f(t)dt = 7(10) = 70$

(b) $\int_0^5 (f(t)+7)dt = \int_0^5 f(t)dt + \int_0^5 7dt = 10+35 = 45$

(c) $\int_0^5 f(t)dt + 7 = 10+7 = 17$

(d) Not enough information as we don't know f's behavior on interval [7, 12].

(e) $\int_{-7}^{-2} 7f(t+7)dt = \int_0^5 7f(t)dt = 7\int_0^5 f(t)dt = 7(10) = 70$