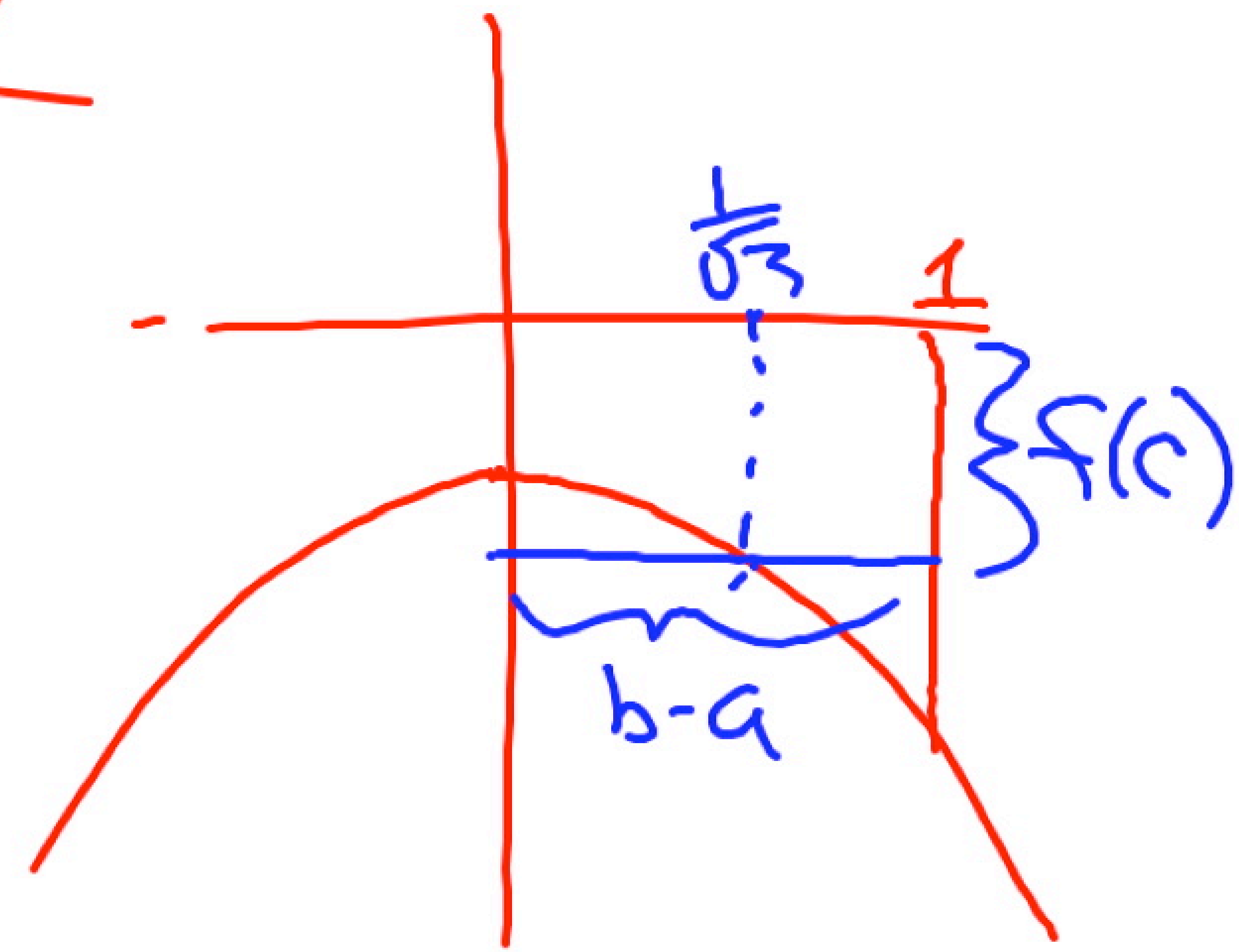
$$-3x^2 - 1 = -2$$

$$-3x^2 = -1$$

$$x^2 = \frac{1}{3}$$

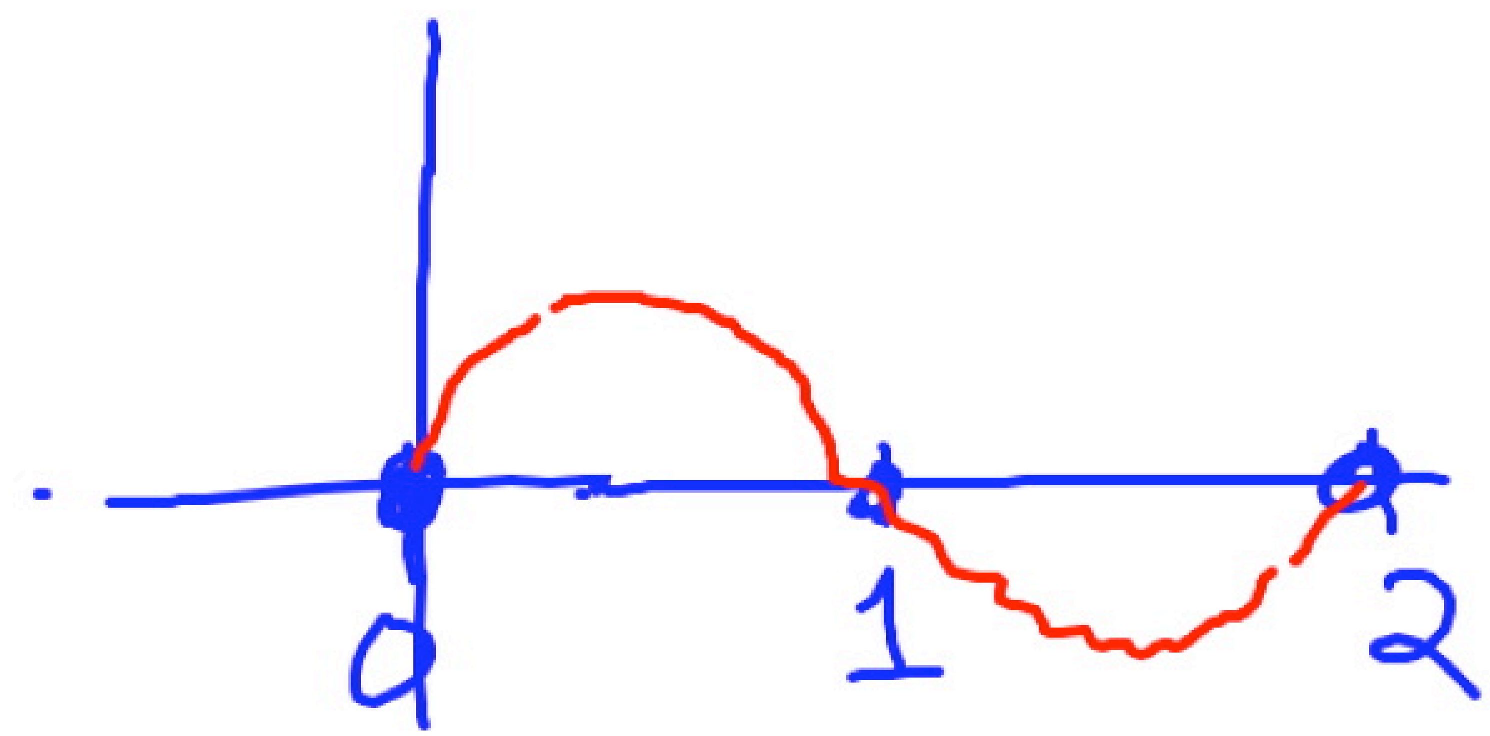


$$y = x^3 - 3x^2 + 2x$$

$$x(x^2 - 3x + 2) = 0$$

$$x(x-2)(x-1) = 0$$

$$x = 0, 2, 1$$




$$A = \int_0^1 x^3 - 3x^2 + 2x \, dx + \left| \int_1^2 x^3 - 3x^2 + 2x \, dx \right|$$

$$\frac{x^4}{4} - x^3 + x^2 \Big]_0^1 + \left| \frac{x^4}{4} - x^3 + x^2 \Big]_1^2 \right| = \frac{1}{4} + \left| 4 - 8 + 4 - \frac{1}{4} \right| = \frac{1}{2}$$

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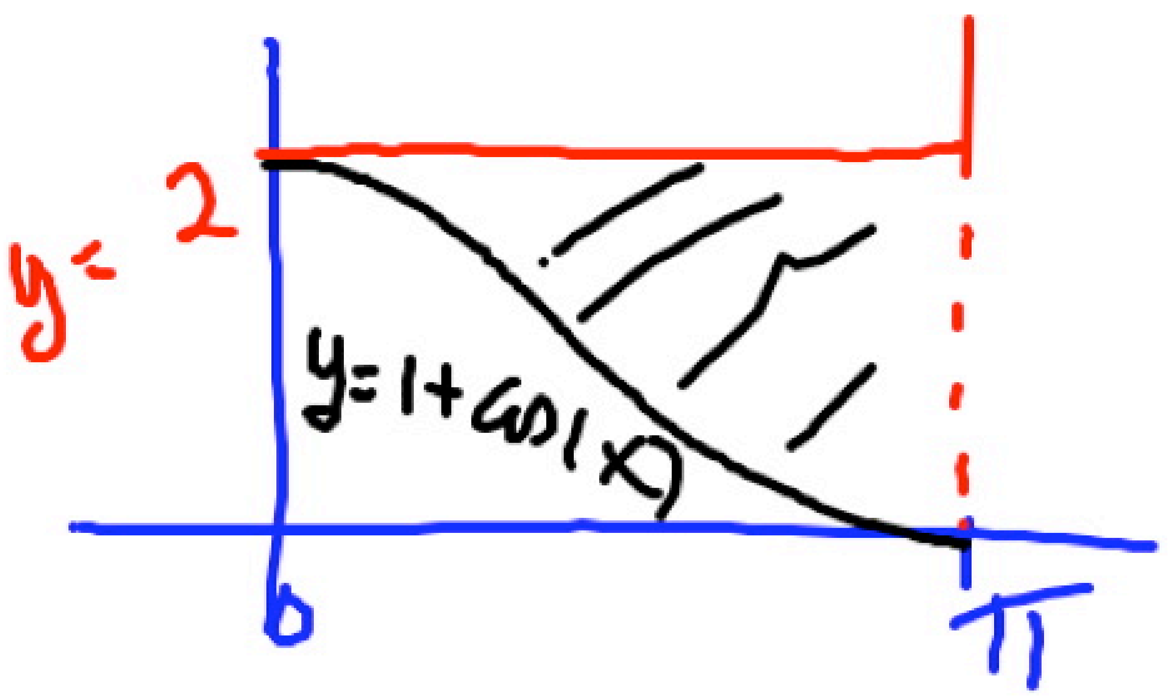
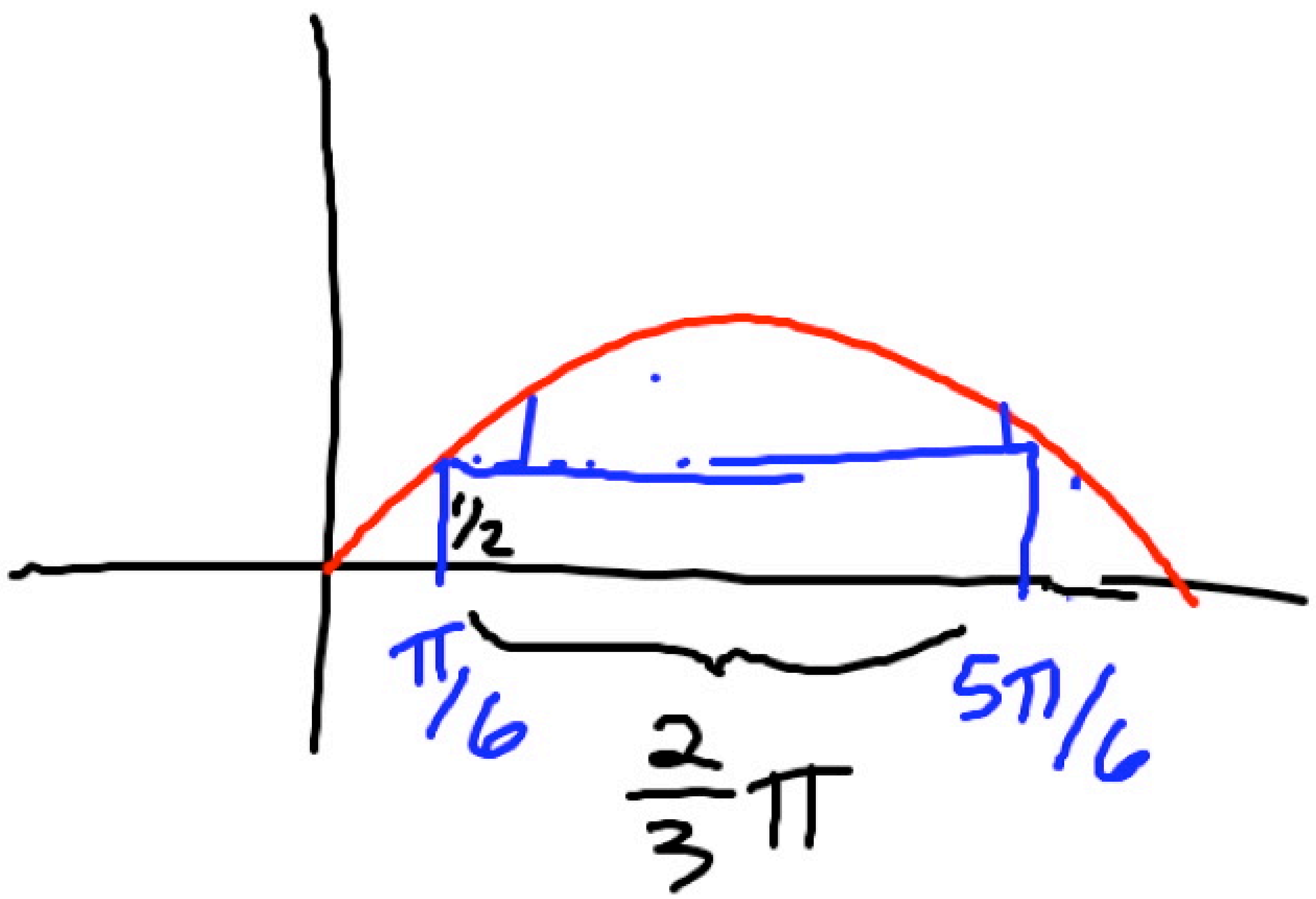
$$2\pi - \int_0^{\pi} 1+\cos(x)\,dx$$

$$2\pi - \left( x + \sin(x) \Big]_0^{\pi} \right)$$

$$2\pi - \left( \pi + 0 - (0 - 0) \right)$$

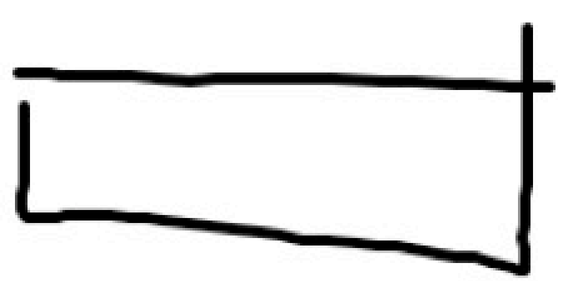
$$= \pi$$






$$A = \int_{\pi/6}^{5\pi/6} \sin(x)\,dx - \pi/3$$

$$-\cos(x)\Big]_{\pi/6}^{5\pi/6} - \pi/3$$

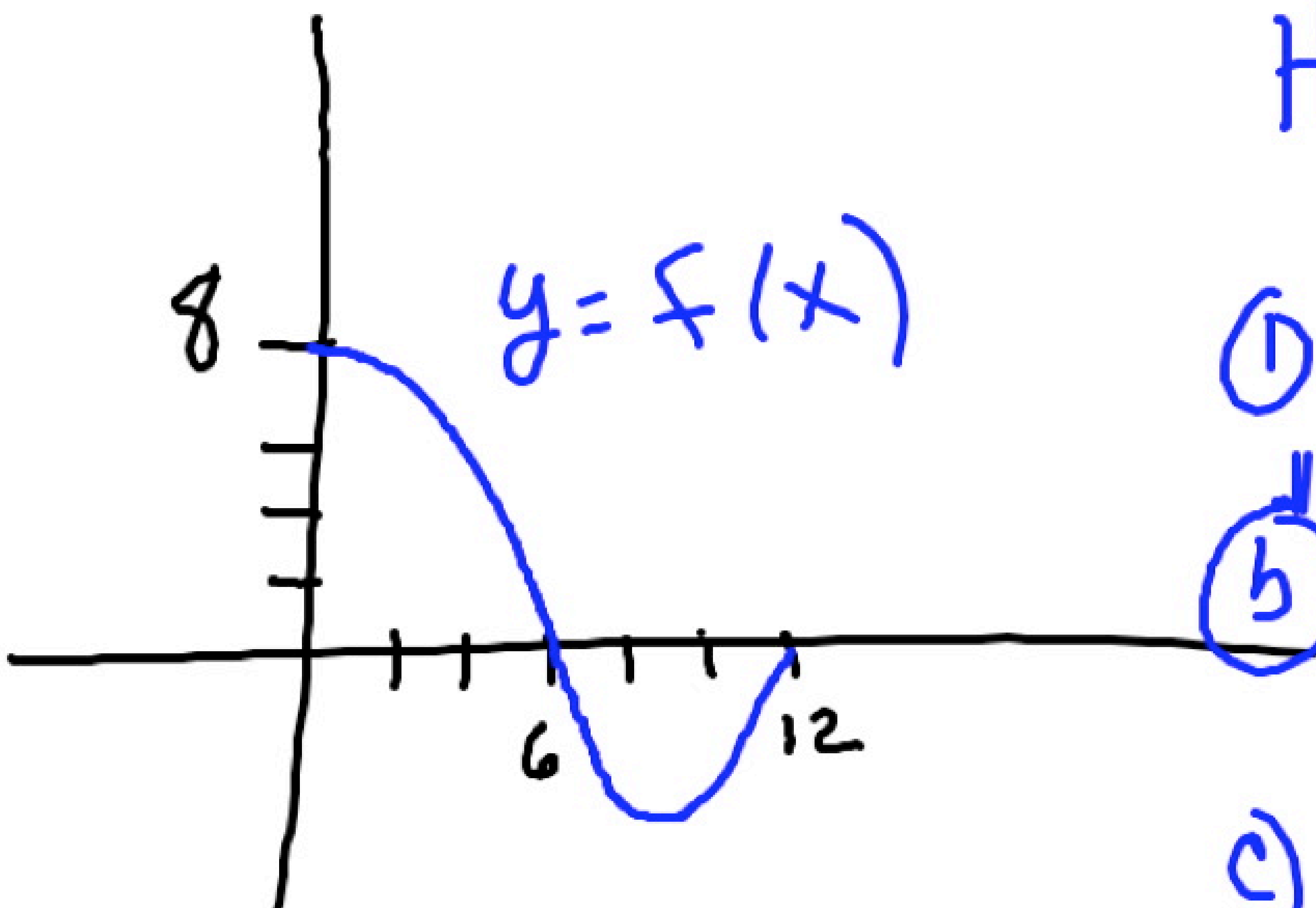


$$= \frac{1}{2}\cdot\frac{2}{3}\pi$$

$$= \pi/3$$

$$-\left[\cos(5\pi/6) - \cos\pi/6\right] - \pi/3$$

$$-\left(-\sqrt{3}/2 - \sqrt{3}/2\right) - \pi/3 = \sqrt{3} - \pi/3$$




$$H(x) = \int_0^x f(t)\,dt$$

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

b) $H' > 0$; $f(x) = H'$

so $f(x) > 0$ $(0, 6)$

c) $H'' > 0$; $f' > 0$ $(9, 12)$

d) $H(12) = \int_0^{12} f(t)\,dt$

$\int_0^6 f(t)\,dt + \int_6^{12} f(t)\,dt$

area from 0 to 6 ← bigger

− area from 6 to 12

$\therefore \int_0^{12} > 0$