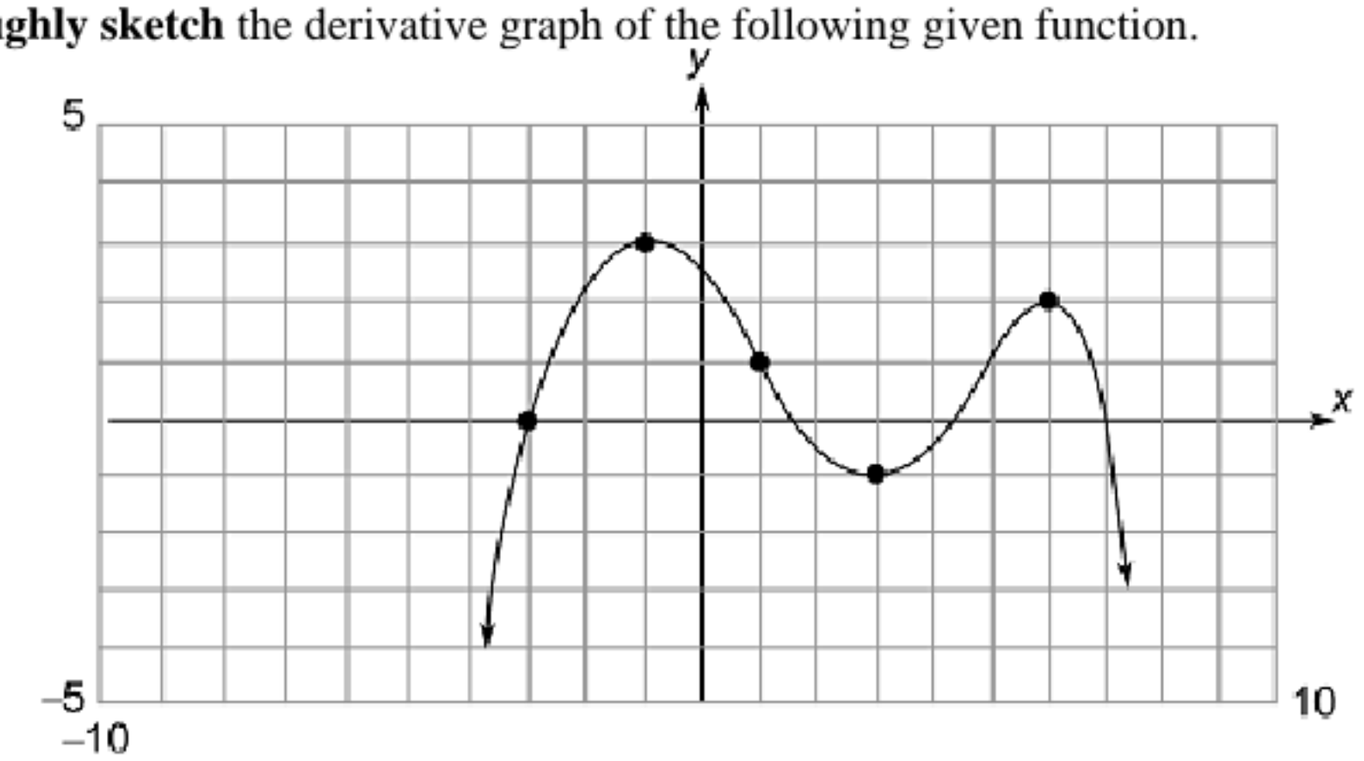
2. **(a)** **Roughly sketch** the derivative graph of the following given function.



3. **(a)** Use appropriate formula of geometry to **evaluate** the following integrals:

(i) $\int_{-3}^{3}\{(x+4)-\sqrt{9-x^2}\}dx$ **(ii)** $\int_{-2}^{3}(5-|x+1|)dx$

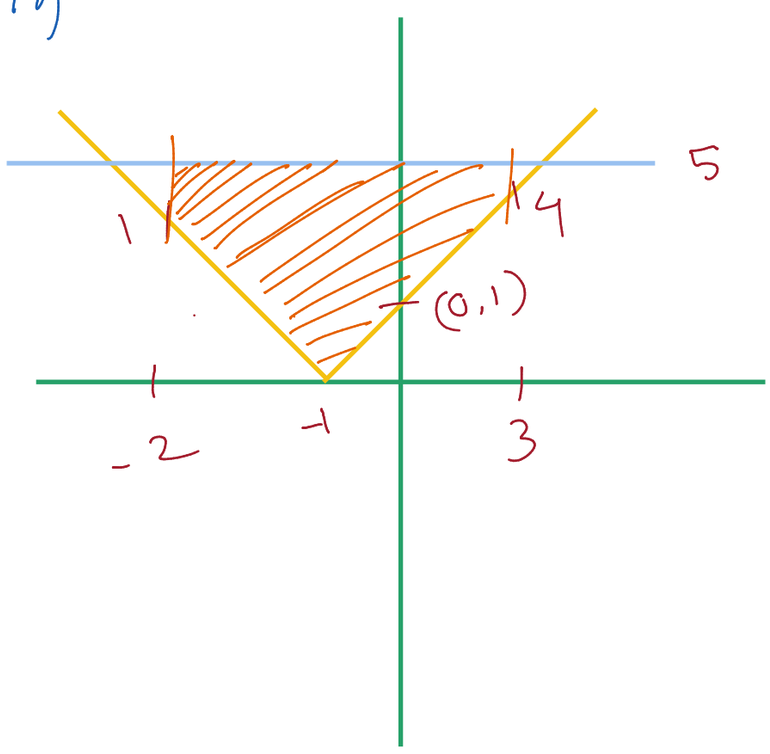
i)

$\frac{1}{2}(7+1)(6) = 24$

$-\frac{1}{2}\pi 3^2 = -\frac{9}{2}\pi$

$24 - \frac{9}{2}\pi$

ii)



$5 \times 5 = 25$

$\frac{1}{2} \times 1 \times 1 + \frac{1}{2} \times 4 \times 4$

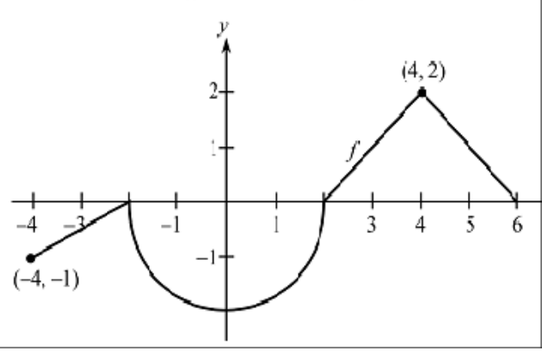
$= \frac{1}{2} + 8 = \frac{17}{2}$

$25 - \frac{17}{2} = \frac{33}{2}$

(b) The graph of $f(x)$ is shown. **Evaluate** the following definite integrals.

(i) $\int_{-2}^{6} f(x)dx$

(ii) $\int_{0}^{4} |f(x)|dx$



i) $-\frac{1}{2}\pi 2^2 + \frac{1}{2} \times 2 \times 4$

$= 4 - 2\pi$

ii) $\frac{1}{4}\pi 2^2 + \frac{1}{2} \times 2 \times 2$

$= \pi + 2$