1) a) $f'(x) = 0$ @ $x = -5, -1, 5$

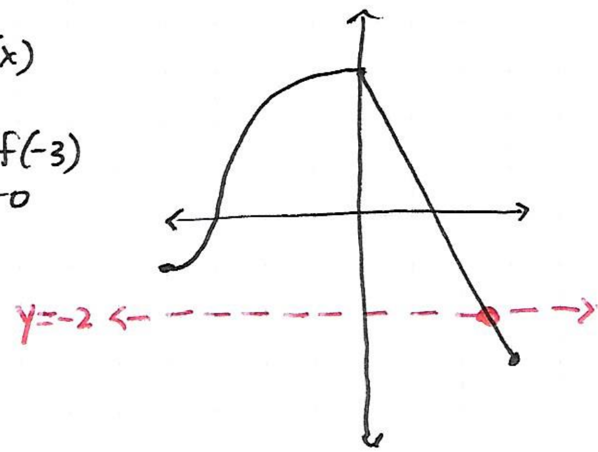
b) $f(x)$ is inc on $[-7,-5), (-1,5), (5,7]$ b/c $f'(x) > 0$

c) $f(x)$ is dec on $(-5,-1)$ b/c $f'(x) < 0$

d) $f(x)$ has a local min @ $x = -1$ b/c $f'(x)$ $\Delta$s signs from $-$ to $+$.

e) $f(x)$ has a local max @ $x = -5$ b/c $f'(x)$ $\Delta$s signs from $+$ to $-$.

2) $g(x) = 2x + \int_0^x f(t)dt \rightarrow g'(x) = 2 + f(x)$




a) $g(-3) = -6 + \int_0^{-3} f(t)dt$

$= -6 - \frac{1}{4}\pi(3)^2$

$= -6 - \frac{9}{4}\pi$

$g'(-3) = 2 + f(-3)$

$= 2 + 0$

$= 2$

b) $g'(x) = 0$ $\quad 2 + f(x) = 0$

$f(x) = -2$ @ $x = 5/2$

SEE GRAPH

$g(x)$ has a local max @ $x = \frac{5}{2}$ b/c $g'(x)$ changes signs from $+$ to $-$.

c) $g(x)$ is inc on $[-4, 5/2)$ b/c $g'(x) > 0$

d) $g(x)$ is dec on $(5/2, 3]$ b/c $g'(x) < 0$

3) $g(x) = \int_0^x f(t)dt \rightarrow g'(x) = f(x)$

a) $g(0) = 0$ $\quad g'(0) = f(0) = 3$

Tangent: $y - 0 = 3(x-0)$

b) $g'(x) = 0$ @ $x = -1$ & $1$

$g(x)$ has a local min @ $x = -1$ b/c $g'(x)$ $\Delta$s signs from $-$ to $+$.

$g(x)$ has a local max @ $x = 1$ b/c $g'(x)$ $\Delta$s signs from $+$ to $-$.

c) $g$ is increasing on $(-1,1)$ b/c $g'(x) > 0$.