Magnet Analysis 1A
Rose

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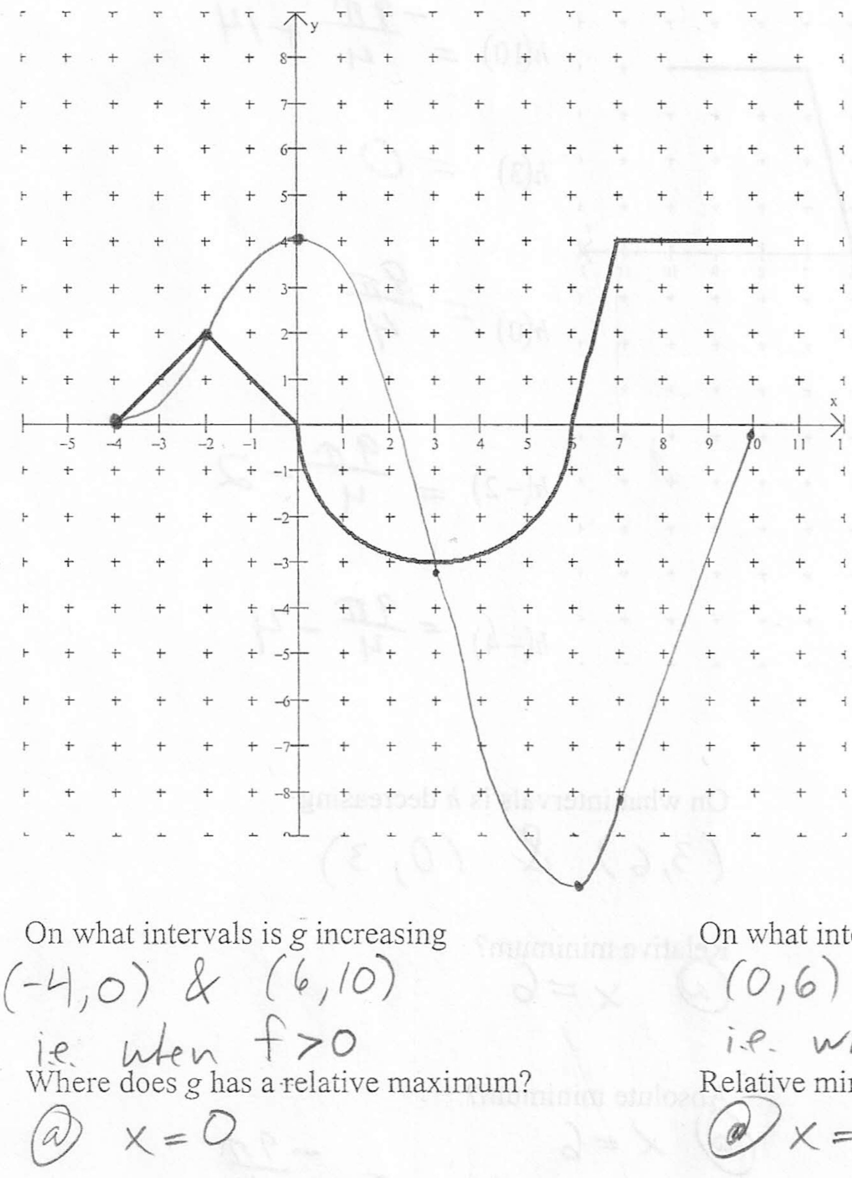
Name KEY

Accumulator Functions

Let $g(x) = \int_{-4}^{x} f(t)\,dt$



Compute

$g(-4) = \int_{-4}^{4} f(t)\,dt = 0$

$g(-2) = 2$

$g(0) = 4$

$g(3) = 4 - \frac{9\pi}{4}$

$g(6) = 4 - \frac{9\pi}{2}$

$g(10) = 18 - \frac{9\pi}{2}$

On what intervals is g increasing

$(-4,0)$ & $(6,10)$

i.e. when $f > 0$

On what intervals is g decreasing

$(0,6)$

i.e. when $f < 0$

Where does g has a relative maximum?

@ $x = 0$

Relative minimum?

@ $x = 6$

Absolute maximum?

@ $x=0$ b/c $\frac{9\pi}{2} > 14$

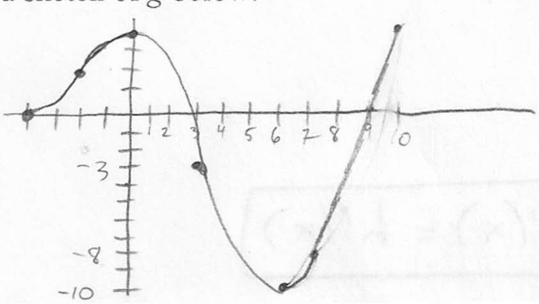
so $g(0) > g(10)$ max $= 4$

Absolute minimum?

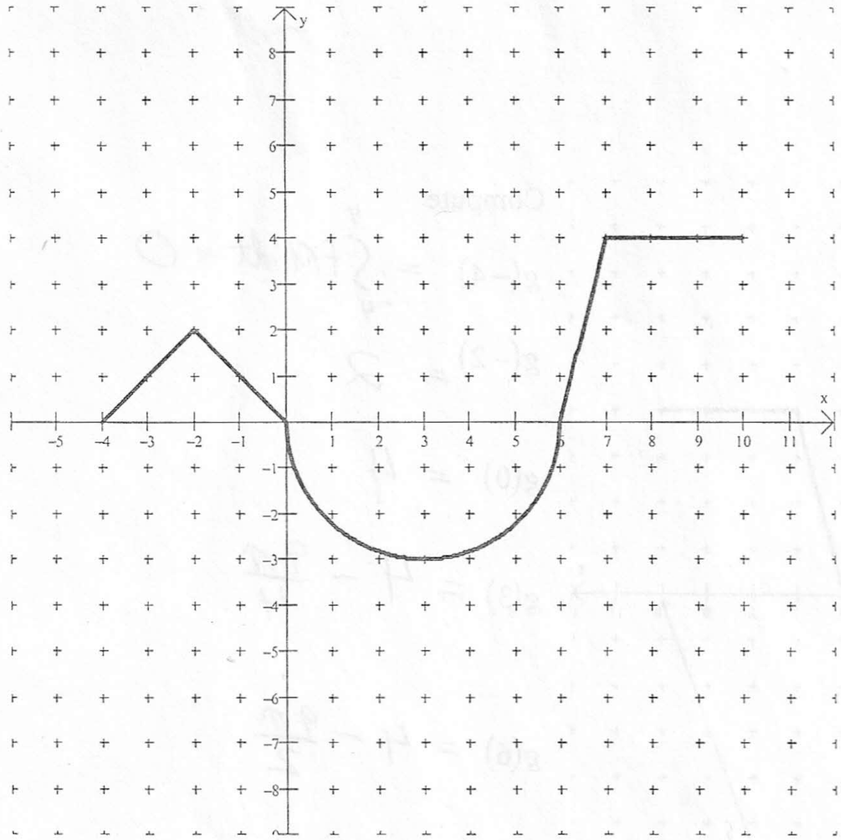
@ $x=6$ b/c $\frac{9\pi}{2} > 4$

so $g(6) < g(-4)$ min $= 4 - \frac{9\pi}{2}$ ≈ -10

Make a sketch of g below:



Let $h(x) = \int_3^x f(t)\,dt$



Compute

$h(6) = \frac{-9\pi}{4}$

$h(10) = \frac{-9\pi}{4} + 14$

$h(3) = 0$

$h(0) = \frac{9\pi}{4}$

$h(-2) = \frac{9\pi}{4} - 2$

$h(-4) = \frac{9\pi}{4} - 4$

On what intervals is h increasing

$(6,10)$ & $(-4,0)$

On what intervals is h decreasing

$(3,6)$ & $(0,3)$

Where does h has a relative maximum?

@ $x=0$

Relative minimum?

@ $x=6$

Absolute maximum?

@ $x=0$

$max = \frac{9\pi}{4}$

Absolute minimum?

@ $x=6$

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

Make a sketch of h below:

$\boxed{g(x) = 4 - \frac{9\pi}{4} + h(x) \quad \text{so} \quad g'(x) = h'(x)}$