How to find absolute extrema over an interval

$g(t) = 2t^3+3t^2-12t+4$ on the interval $[-4,2]$

Abs. extrema occur @ C.N. or Endpts.

① find critical Numbers

$g'(t) = 6t^2+6t-12 = 0$

$6(t^2+t-2) = 0$

$6(t-1)(t+2) = 0$

$t-1=0 \quad t+2=0$

$t=1, \quad t=-2$

Critical Numbers.

② Plug C.N. and endpts into function:

C.N. $\begin{cases} g(1) = 2+3-12+4 = -3 \\ g(-2) = 2(-2)^3+3(-2)^2-12(-2)+4 \\ \quad 16+12+24+4 \\ \quad = 56 \end{cases}$

E.P. $\begin{cases} g(-4) = 2(-4)^3+3(-4)^2-12(-4)+4 \\ \quad -128+48+48+4 \\ \quad = -28 \\ g(2) = 2(2)^3+3(2)^2-12(2)+4 \\ \quad 16+12-24+4 \\ \quad = 8 \end{cases}$

Biggest is 56 (@ $t=-2$)

Smallest is $-28$ (@ $t=-4$)

Abs max: $(-2, 56)$

Abs min: $(-4, -28)$