8. $f(x) = x^2 + 6x - 1 \quad [-5, 2]$

FINDING ABSOLUTE EXTREMA

① FIND DERIVATIVE

$f'(x) = 2x + 6$

② SET DERIV. EQUAL TO ZERO AND SOLVE

$2x + 6 = 0$

$2x = -6$

$x = -3$ C.V.

NOTE: CROSS OUT ANY C.V.'S NOT IN THE INTERVAL

③ PLUG IN C.V.'S AND END POINTS INTO ORIG FUNCTION AND SIMPLIFY

$x = -5$

$y = x^2 + 6x - 1$

$y = (-5)^2 + 6(-5) - 1$

$= 25 - 30 - 1$

$= -5 - 1$

$= -6$

$x = -3$

$y = x^2 + 6x - 1$

$y = (-3)^2 + 6(-3) - 1$

$= 9 - 18 - 1$

$= -9 - 1$

$= -10$

$x = 2$

$y = x^2 + 6x - 1$

$y = 2^2 + 6(2) - 1$

$= 4 + 12 - 1$

$= 16 - 1$

$= 15$

ABS. MIN IS LOWEST y VALUE

ABS. MIN: $(-3, -10)$

ABS. MAX IS LARGEST y VALUE

ABS. MAX: $(2, 15)$