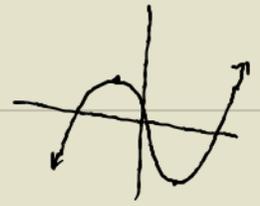1. $f(x) = x^2 + 6x + 5$

FINDING RELATIVE EXTREMA

① FIND DERIVATIVE

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

② SET DERIVATIVE EQUAL TO ZERO AND SOLVE

$$2x + 6 = 0$$
$$2x = -6$$
$$\frac{2x}{2} = \frac{-6}{2}$$
$$x = -3 \quad \text{"CRITICAL VALUE"}$$

③ USING CRITICAL VALUE(S) BUILD A TABLE OF INTERVALS, PICK TEST CASES, PLUG INTO DERIVATIVE AND SIMPLIFY

POSITIVE	NEGATIVE
/	\

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        -∞            X = -3              ∞
TEST      |              |                  |
CASES     |   X = -4     |    X = 0         |
          |              |                  |
PLUG INTO |              |                  |
f'(x)     |   2x + 6     |    2x + 6        |
          |   2(-4)+6    |    2(0) + 6      |
          |   -8+6       |    0 + 6         |
          |   -2         |    6             |
              \               /
             REL
             MIN
```

④ PLUG IN THIS X VALUE INTO ORIGINAL FUNCTION TO FIND y

$$y = x^2 + 6x + 5$$
$$y = (-3)^2 + 6(-3) + 5$$
$$y = 9 - 18 + 5$$
$$y = -9 + 5 = -4$$

REL MIN
(-3, -4)