

$$3. \quad p = 80 - X \quad C = 200 + 40X$$

MAXIMIZE PROFIT

$$P = R - C$$

$$P = R - C$$

$$P = xP - C$$

$$\text{AND } R = xP$$

$$P = x(80 - x) - (200 + 40x)$$

$$P = 80x - x^2 - 200 - 40x$$

$$P = -x^2 + 40x - 200$$

$$\frac{dP}{dx} = -2x + 40$$

$$-2x + 40 = 0$$

$$40 = 2x$$

$$20 = x$$

TEST CASES
PLUG INTO
DERIV.

	0	$X = 20$	∞
	$X = 1$		$X = 30$
	$-2X + 40$		$-2X + 40$
	$-2(1) + 40$	max	$-2(30) + 40$

MAX AT $X = 20$

$$p = 80 - X$$

$$p = 80 - 20$$

$$p = \$60$$