8. $p = 500 - 2x \quad x = 50 \quad \frac{dp}{dx} = -2$

FINDING INTERVALS OF ELASTICITY / INELASTICITY

① FIND $\eta = \frac{p/x}{dp/dx}$

$$\eta = \frac{\frac{500-2x}{x}}{-2}$$

$$\eta = \frac{500-2x}{-2x}$$

② NOW SOLVE $|\eta| = 1$

$$\left|\frac{500-2x}{-2x}\right| = 1$$

$$\frac{500-2x}{-2x} = 1 \qquad \frac{500-2x}{-2x} = -1$$

$$-2x\left(\frac{500-2x}{-2x}\right) = 1(-2x) \qquad -2x\left(\frac{500-2x}{-2x}\right) = -1(-2x)$$

$$500 - 2x = -2x \qquad 500 - 2x = 2x$$

$$500 = -2x + 2x \qquad 500 = 2x + 2x$$

$$500 = 0 \qquad 500 = 4x$$

$$\frac{500}{4} = \frac{4x}{4}$$

$$125 = x$$

C.V.

③ BUILD A TABLE OF INTERVALS BASED ON THE CRITICAL VALUE, PICK TEST CASES, PLUG THEM INTO $|\eta|$ AND SIMPLIFY

$\lvert\eta\rvert > 1$	$\lvert\eta\rvert < 1$
ELASTIC	INELASTIC

	$x=0$	$x=125$	∞
TEST CASES	$x=1$	$x=200$	
PLUG INTO $\lvert\eta\rvert$	$\left\lvert\frac{500-2x}{-2x}\right\rvert$ $\left\lvert\frac{500-2(1)}{-2(1)}\right\rvert$	$\left\lvert\frac{500-2(200)}{-2(200)}\right\rvert$ $\left\lvert\frac{100}{-400}\right\rvert$	
	>1	$\frac{1}{4}$	
	ELASTIC	<1	
		INELASTIC	

ELASTIC $(0, 125)$

INELASTIC $(125, \infty)$

NOW PLUG IN $x = 50$

$$\left|\frac{500-2x}{-2x}\right|$$

$$\left|\frac{500-2(50)}{-2(50)}\right|$$

$$\left|\frac{400}{-100}\right|$$

$$|-4|$$

4 ELASTIC