

Your business has demand $f(p)=200(30-p)$,

when is price elastic? At price $p = 12$, should you raise prices?

$$f'(p) = -200$$

$$E(p) = \frac{p f'(p)}{f(p)} = \frac{-200p}{6000 - 200p} < -1 \quad \text{for elasticity}$$

$$-200p < -6000 + 200p$$

$$6000 < 400p$$

$$15 < p < 30$$

why?

$f(30) = 0$, problem does not make physical sense for $p \geq 30$

At $p=12$, demand is inelastic, should raise prices.