Consider two firms in a given labor market where **Firm A** has a labor demand schedule parameterized by $L_D^A = 60 - 2W^A$ and **Firm B** is parameterized by $L_D^B = 67 - .8W$, and where $L_S = W - 3$ (the same for both firms). Union organizers can target only one of these firms and promise that a $3 increase in wages for workers at that firm will be such that any workers that lose their jobs as a result of increased labor costs will be able to find jobs with the other firm at wages no less than their current wage.

1. **Identify the own-wage elasticity for workers at each firm based on the proposed wage increase and determine which firm is most likely to be targeted by the union organizer. Also identify the initial levels of wage and labor for each firm separate from the levels after the proposed change. This allows us some L_D^1, L_D^2, W^1 , and W^2 so we can set up the elasticity equation**

Firm A	Firm B
$L_D^A = L_S$	$L_D^B = L_S$
$60 - 2W^A = W^A - 3$	$67 - 0.8W^B = W^B - 3$
$63 = 3W^A$	$70 = 1.8W^B$
$W^A = 21 = W_A^1$	$W^B = 38.89$
$L^A = (21) - 3 = 18 = L_A^1$	$L^B = (38.89) - 3 = 35.89$
$W_A^2 = 21 + 3 = 24$	$W_B^2 = 38.89 + 3 = 41.89$
$L_A^2 = 60 - 2(24) = 12$	$L_A^2 = 67 - 0.8(41.89) = 33.48$

Since we're about to consider an own wage elasticity, we use each firm's labor demand equation to come up with the new levels of labor demanded.

Own wage elasticity

Firm A
$$\frac{\frac{L_A^2 - L_A^1}{L_A^1}}{\frac{W_A^2 - W_A^1}{W_A^1}} = \frac{\frac{12-18}{18}}{\frac{24-21}{21}} = -\frac{\frac{6}{18}}{\frac{3}{21}} = \left(-\frac{6}{18}\right)\left(\frac{21}{3}\right) = -\frac{126}{54} = -2.33 > |-1| \quad elastic$$

Firm B
$$\frac{\frac{L_B^2 - L_B^1}{L_B^1}}{\frac{W_B^2 - W_B^1}{W_B^1}} = \frac{\frac{33.48-35.89}{35.89}}{\frac{41-89-38.89}{38.89}} = -\frac{\frac{2.41}{35.89}}{\frac{3}{38.89}} = \left(-\frac{2.41}{35.89}\right)\left(\frac{38.89}{3}\right) = -\frac{93.72}{107.67} = -0.87 < |-1| \quad inelastic$$

Firm B is more likely to be unionized since it is more inelastic than Firm A. This means that it's workers are less likely to suffer large declines in levels of workers in respect to increases in wage

2. **Assuming the organizer is successful in unionizing the workers at the targeted firm and that the wage increase is negotiated at that firm, determine the outcome for workers at the remaining non-union. Assume that the non-union firm is the only other possible employer in the market. How will their wages change?**

    After Unionization at Firm B

    Firm B
    Pre-Union $L_S^B = 35.89$
    Post-Union $L_S^A = 33.48$
    Laid Off   35.89 – 33.48 = 2.41

    Firm A
    Pre-Union $L_S^A = W - 3$
    Post-Union $L_S^A = W - 3 + 2.41 = W - 0.59$

    The effect of Unionization at Firm B on Firm A

    $L_D^A = L_S$

    $60 - 2W^A = W^A - 0.59$

    $W^A = 20.19$

    $W_{POST}^A - W_{PRE}^A = \Delta W^A = 20.19 - 21 = -.81$

    $L_{POST}^A = W - 0.59 = 20.19 - 0.59 = 19.6$

3. **Now assume that some time has passed, the collective bargaining agreement between the firm and workers has lapsed and the Union is making wage demands far greater than the firm can pay. If the firm's offer can be parameterized by the equation $W^F = 15 + 1.5S - S^2$ and the Union's demands can be parameterized by the equation $W^U = 10 + 2S + S^2$, how long might you expect a strike to last?**

    $W^F = W^U$

    $15 + 1.5S - S^2 = 10 + 2S + S^2$

    $0 = 2S^2 + .5S - 5$

    Use the Quadratic Formula: $S = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

    $S = \dfrac{-\frac{1}{2} \pm \sqrt{\left(\frac{1}{2}\right)^2 - 4(2)(-5)}}{2(2)} = \dfrac{-\frac{1}{2} \pm \sqrt{.25 + 40}}{4} = \dfrac{-\frac{1}{2} \pm 6.34}{4} = 1.46 \; or - 1.71$

    So... either the strike was over about 12 days ago, or it will likely only last about a week and a half

4. **Without knowing anything of the firm or unions offer and demand relationship, might you have predicted a long or short strike? Explain why.**

    A short strike would be expected given the relative difficulty in substituting these workers – they have an inelastic own wage demand of -.87!