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CONCEPT: THE PRODUCTION FUNCTION AND MARGINAL REVENUE PRODUCT

- **Factors of Production (Resources)** are classified into the following categories:

- Land** – all _____ used in the production process
- Labor** – physical and mental contributions of the people in the production process
- Physical Capital** – factories and equipment used in the production process
- Human Capital** – productivity of the labor force
- Entrepreneurship** – the resource that organizes, manages, and assembles the other factors of production

- The **production function** relates the amount of inputs (i.e. workers) to the amount of output (i.e. quantity)

- Marginal Product of Labor** – increase in output from adding one more worker

- **Value of the Marginal Product of Labor** = _____

EXAMPLE: A local pizza shop leases two pizza ovens for a total daily cost of \$100. The pizza company is deciding how many employees to hire at a wage of \$80 per day. Assume the cost of ingredients is negligible. Each pizza sells for \$5.

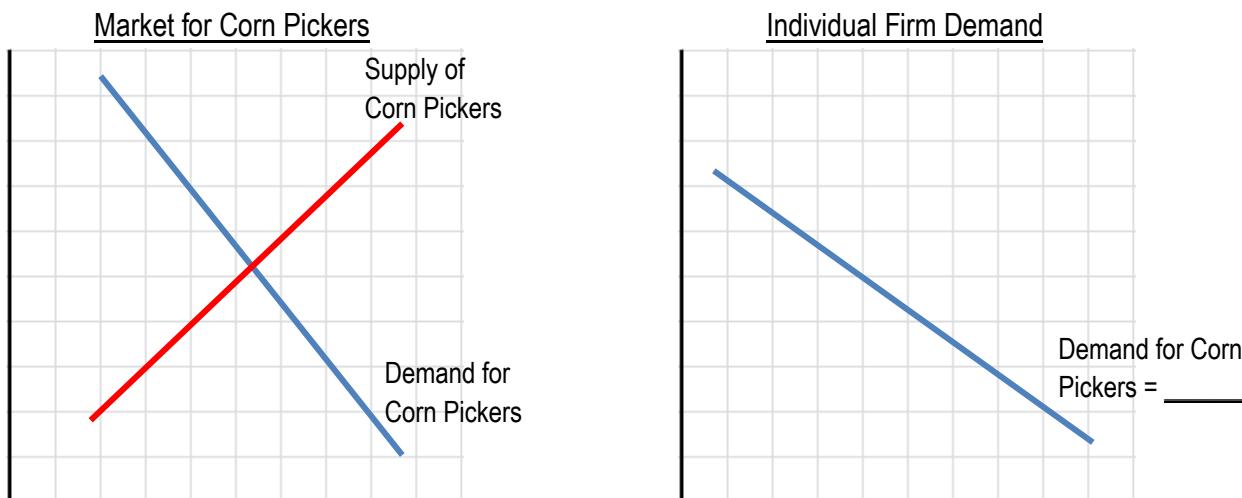
Number of Pizza Ovens	Number of Workers	Total Quantity of Pizzas	Marginal Product of Labor	Marginal Revenue Product	Wage	Marginal Profit
2	0	0				
2	1	30				
2	2	80				
2	3	150				
2	4	180				
2	5	190				

- A competitive, profit-maximizing firm will hire workers up to the point where _____
- The _____ is the firm's _____ for labor

CONCEPT: DEMAND FOR LABOR IN PERFECT COMPETITION

- A firm's demand for labor _____ on the demand for the good being produced.

The demand for labor (and other factors of production) is a _____



Equilibrium occurs in a labor market just like in a market for goods and services.

PRACTICE: A profit-maximizing, competitive firm has a demand curve for labor determined by:

- The opportunity cost of the laborers' time
- The value of the marginal product of capital
- Offsetting the income and substitution effects
- The value of the marginal product of labor

PRACTICE: A cupcake shop in a competitive market sells its cupcakes for \$20 per dozen. It hires its laborers at a wage of \$10 per hour. To maximize its profit, the firm should hire laborers until the marginal product of labor is

- 15 dozens per hour
- 10 dozens per hour
- 2 dozens per hour
- ½ dozen per hour

CONCEPT: SHIFTS IN LABOR DEMAND: OUTPUT PRICE

- The demand for labor can shift left or right just like the demand for goods.
 - A change in the **output price** will shift labor demand.
 - If the output price increases, labor demand shifts _____
 - If the output price decreases, labor demand shifts _____

EXAMPLE: The price of a pizza decreases

Output Price = \$5 per pizza ; Wage = \$80

Number of Pizza Ovens	Number of Workers	Total Quantity of Pizzas	Marginal Product of Labor	Marginal Revenue Product	Wage	Marginal Profit
2	0	0	-	-	-	-
2	1	30	30	150	80	70
2	2	80	50	250	80	170
2	3	150	70	350	80	270
2	4	180	30	150	80	170
2	5	190	10	50	80	-30

Output Price = \$2 per pizza ; Wage = \$80

Number of Pizza Ovens	Number of Workers	Total Quantity of Pizzas	Marginal Product of Labor	Marginal Revenue Product	Wage	Marginal Profit
2	0	0	-			
2	1	30	30			
2	2	80	50			
2	3	150	70			
2	4	180	30			
2	5	190	10			

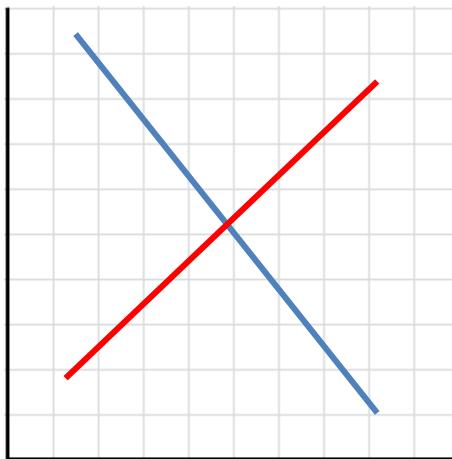
CONCEPT: SHIFTS IN LABOR DEMAND: TECHNOLOGICAL CHANGE

- A technological change can either be a _____ or _____ to labor.

A **substitute technology** (labor-)_____ would shift labor demand _____

- Labor-saving technology → _____ to use tech instead of labor → _____ workers to maximize profit

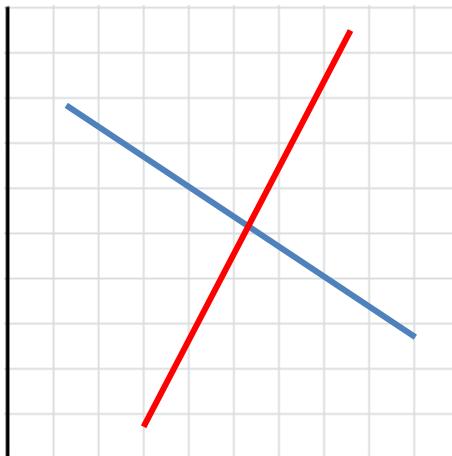
EXAMPLE: The producers of really cool hats originally hired many laborers to customize their really cool hats. However, a new fashion-forward robot can produce really cool hats more efficiently than the laborers. What will happen to the demand for really cool hat laborers?



A **complementary technology** (labor-)_____ would shift labor demand _____

- Labor-augmenting technology → _____ MPL of each worker → _____ workers to maximize profit

EXAMPLE: The producers of really cool hats originally hired many laborers to customize their really cool hats. The invention of a futuristic needle allows workers to produce hats twice as fast. What will happen to the demand for really cool hat laborers?



CONCEPT: SUPPLY OF LABOR IN PERFECT COMPETITION

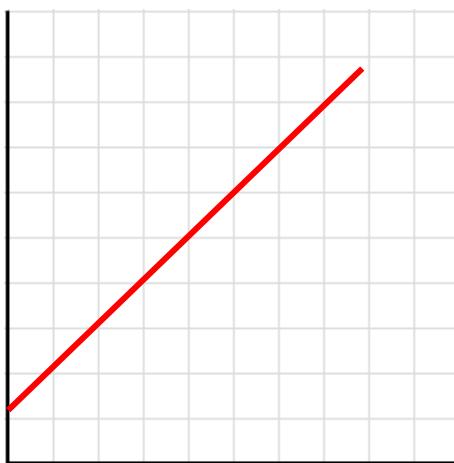
- The supply of labor is usually depicted the same way as the supply for a good.

When we decide to work, we give up our _____ time

- Leisure includes _____ that is not work itself

- **Reservation wage** – the _____ wage that a person is willing to take

As wages increase, the supply of labor _____



- On the individual level, it is possible for the supply curve to _____

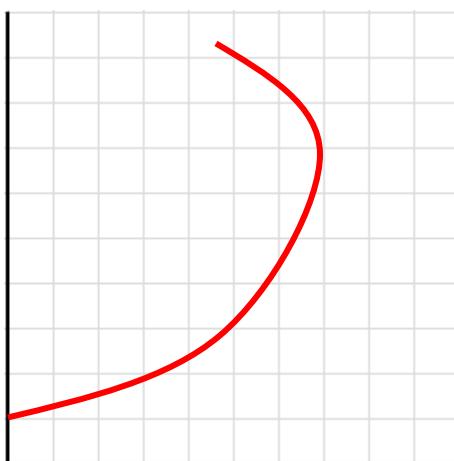
As wages increase, a person earns more money

After reaching a high wage, the person may value leisure more than work

- **Substitution effect** – Increased wages raise the _____ of leisure time

- **Income effect** – Increased wages give the consumer more _____

> Wages increase → Leisure is a _____ good → Quantity demanded of leisure _____



CONCEPT: SHIFTS IN LABOR SUPPLY

- The ***size of the population*** has a direct effect on the supply of labor

If the population increases, labor supply shifts _____

- Immigration

- Births exceed deaths

If the population decreases, labor supply shifts _____

- The ***demographics*** of the labor force also affects the labor supply

The more people that are _____, the greater the supply of labor

- Baby Boomers in the 1970s and 1980s

- Women in the workforce

- The ***availability of alternative opportunities*** in other labor markets also affects the supply of labor

If the wage increases in a similar market, the supply of labor in the first market _____

If the wage decreases in a similar market, the supply of labor in the first market _____

- Apple Pickers vs. Orange Pickers

PRACTICE: A low birthrate in Japan led to a general increase in the age of the population in the country. During the 1990s, this led to a decrease in the number of working age people in Japan. What would we expect to occur in the labor market?

- Labor demand increases
- Labor demand decreases
- Labor supply increases
- Labor supply decreases

PRACTICE: The wages paid to pastry and sous chefs are \$15 and \$25, respectively. If pastry and sous chefs are alternative opportunities and the sous chef wage increased to \$30, what would occur in the labor market for pastry chefs?

- Labor demand increases
- Labor demand decreases
- Labor supply increases
- Labor supply decreases

CONCEPT: DIFFERENCES IN WAGES

- Not all jobs are created equal! Some jobs are easy, some are hard. Some aspects of a job may be unpleasant.

Compensating differential – a higher wage that rewards a worker for taking a less pleasant job

Nice Guy Nick's Flower Shop → Wage \$ _____

Angry Andy's Flower Shop → Wage \$ _____

- The worker's **human capital** will also affect her wage.

Human capital – represents the education and training of the workforce

- Higher human capital → _____ wage

- Lower human capital → _____ wage

- Some employers pay wages above equilibrium as an _____ to their employees.

A wage _____ the equilibrium wage is called an **efficiency wage**

- The opportunity cost of losing an efficiency-wage job is _____

- If you are fired, you will likely have to accept a _____ paying job (non-efficiency wage)

- Workers are motivated to perform well to avoid being fired

- How do "superstars" make so much money? The equilibrium wage depends on the _____

Professional football players create football games, which can be sold at a very high price

- The supply of professional football players is _____

- The demand for professional football players is _____

High school teachers create educational products, which can be sold at a very low price

- The supply of high school teachers is _____

- The demand for high school teachers is _____

CONCEPT: DIFFERENCES IN WAGES: DISCRIMINATION

- ***Economic discrimination*** – paying someone a lower wage (or not hiring) based on an _____ characteristic
 - The most common forms of discrimination are: _____ and _____
 - _____ make considerably more money than any other demographic group.
- Some, but not all, of the differences in wages for white males can be explained by the following factors:
 - Differences in education:** White males have historically had more opportunities to receive higher education
 - Differences in experience:** Men generally have less job _____, such as pregnancy
 - Differences in job preferences:**
 - Women represent approximately 90 percent of people employed in some low-paying jobs
 - > Preschool teachers, dental assistants, childcare
 - Men represent approximately 90 percent of people employed in some high-paying jobs
 - > Airline pilots, electricians, engineering managers
- Overcoming the forces of discrimination can be difficult because it is often times _____
 - The lingering effects of slavery and segregation still affect African-Americans in the United States
 - Inferior schools → _____ human capital
 - Discriminating employers don't hire African Americans → _____ work experience
- However, on the bright side, discrimination _____

Peace and Love Patrick:	Discriminating Dave:
Hires any qualified candidate: \$ _____	Hires only white males: \$ _____

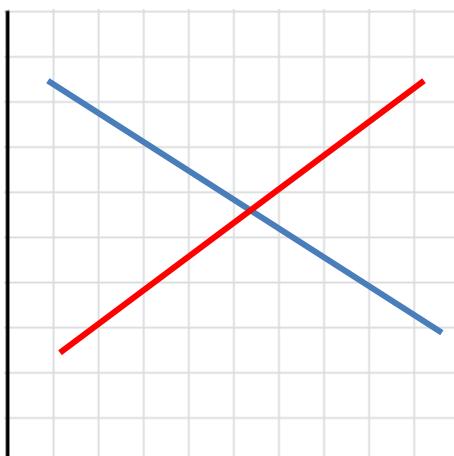
CONCEPT: OTHER FACTORS OF PRODUCTION: LAND AND CAPITAL

- Labor earns _____. Land earns _____. Capital earns _____.
- The demand for land will depend on the _____ that the firm can earn from the land.
 - Just like the MRP for labor, there is a MRP for land:
 - With one more unit of land, how much more revenue will we make?
 - The demand curve for land will be the _____ for land.
- The supply of land is _____
 - As Will Rogers (and Mark Twain) said: "Buy land, they ain't making any more of the stuff."
 - The supply curve for land is _____ (or very close to it)



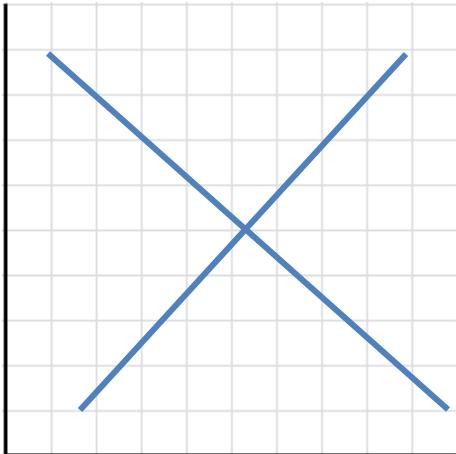
- **Capital** is the equipment and structures used to produce goods and services.

- The demand for capital follows the same logic as land and labor. The demand curve is the _____
- The supply curve for capital is _____. As the rental price increases, the supply _____



CONCEPT: LABOR UNIONS

- **Labor unions** are organizations that try to raise wages and improve working conditions for their members
 - *Collective bargaining* – negotiating with an entire group of workers rather than individual workers
 - The need for labor unions spawned from worker abuses by industrialists (i.e. long hours, low pay, bad conditions)

Union Effect on Labor Equilibrium

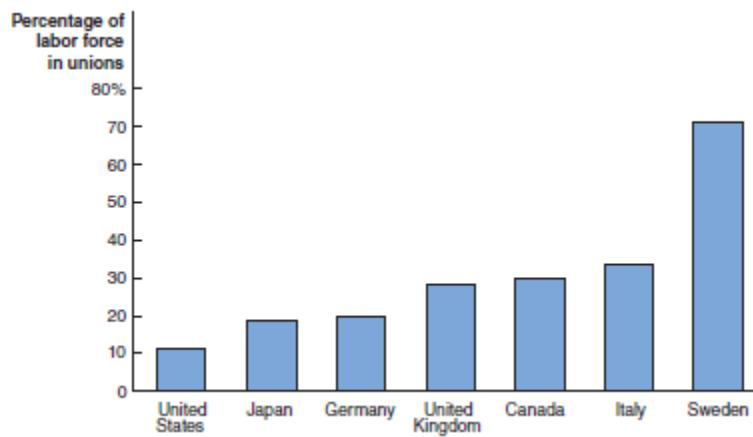
Influence on Labor Supply → _____

- Controlling entry into apprenticeship programs
- Influencing job qualification standards

Influence on Labor Demand → _____

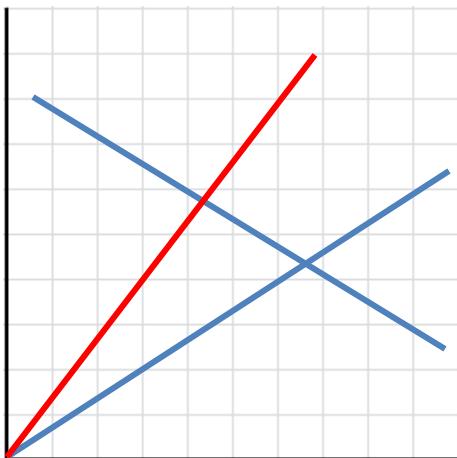
- Improving MP_L with training and certification programs
- Encouraging purchase of unionized goods
- Supporting minimum wage laws (increases demand for high-skilled labor)

- In general, labor unions lead to a _____ equilibrium wage and a _____ equilibrium quantity
- Union membership has been on a general _____ in the United States

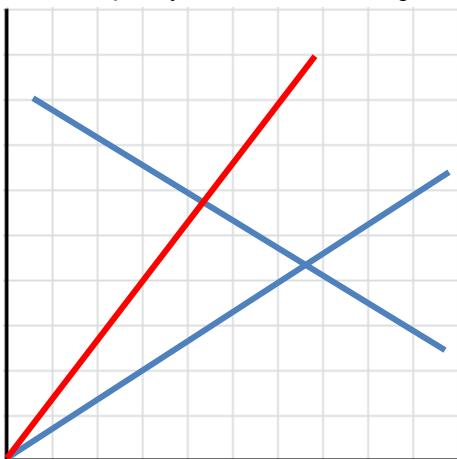


CONCEPT: MONOPSONY

- A **monopsony** is a market with a single _____. In the case of a labor market, there is only one _____
 - Example: A small town that exclusively produces lumber. A small town where Walmart is the main employer
 - A monopsony acts in many ways similar to a monopoly:
 - > Maximize profit by hiring the quantity of workers that make $MC_L = MRP$
 - > In a competitive labor market, $Wage = MC_L$. For a monopsony, $MC_L > Wage$
 - Hiring one more worker, monopsony must offer a higher wage, increase wage for all employees

Monopsony

- In a monopsony, a minimum wage law will cause the equilibrium wage and quantity to _____

Monopsony with Minimum Wage

CONCEPT: BILATERAL MONOPOLY

- A **bilateral monopoly** combines a _____ and a _____. A market with a _____ buyer and seller

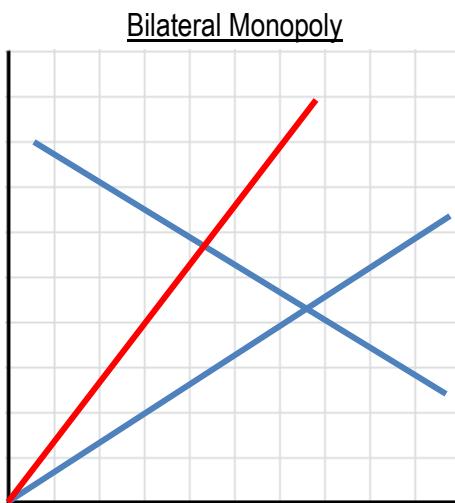
Example: The Writer's Guild of America negotiating with an employers' alliance of CBS, MGM, NBC, etc.

> Every three years, the two parties renegotiate a pay deal

In a bilateral monopoly, the struggle between the needs of the two groups results in heavy negotiation:

> Employer wants the below-average wage of a monopsony

> Employee wants the above-average wage of a union



- A bilateral monopoly results in _____ wage and _____ equilibrium quantity

The wage will be determined through the negotiation process

- Is a bilateral monopoly desirable?

In essence, the monopolies cancel each other out, leading to near-competitive results

If the negotiating power is roughly the same for both parties, they may agree on the competitive wage

The results are more desirable than if just one party had monopoly power