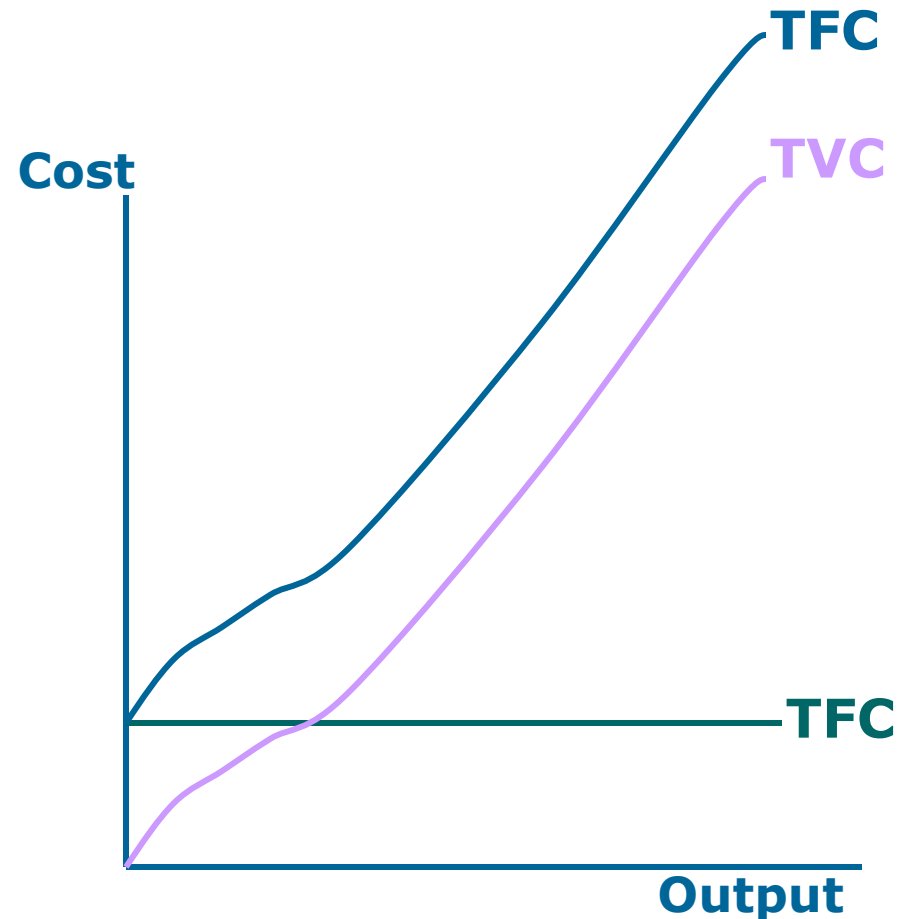


The background features several large, stylized, overlapping swirls in shades of purple, green, and light blue. Interspersed among these swirls are numerous small, yellow, starburst-like shapes, some pointing towards the center and others pointing outwards, creating a dynamic and celebratory feel.

# **AP Microeconomics**

# Total Costs

- $TC = TFC + TVC$
- $TFC = \text{Fixed Costs}$ 
  - Constant costs paid regardless of production
- $TVC = \text{Variable Costs}$ 
  - Costs that vary as production is changed





# Profit = TR - TC

- Accounting:
  - Calculates actual costs a business incurs
  - Explicit!!
  - Ex) inputs, salaries, rent, both fixed and variable
- Economic:
  - Calculates all accounting costs plus the *what if*, or opportunity, costs
  - Implicit!!!!



# Short Run vs. Long Run

- Short Run

- At least one fixed factor of production, usually capital
- No Expansion
- No entry/exit industry

- Long Run

- All factors are variable
- Expansion possible
- Yes can enter or leave industry



# Production Considerations

- Total Product: the relationship btwn inputs and outputs
- Marginal Product: the extra product gained by the change in inputs;  
 $MP = \Delta TP$
- Average Product:  $AP = TP/q$

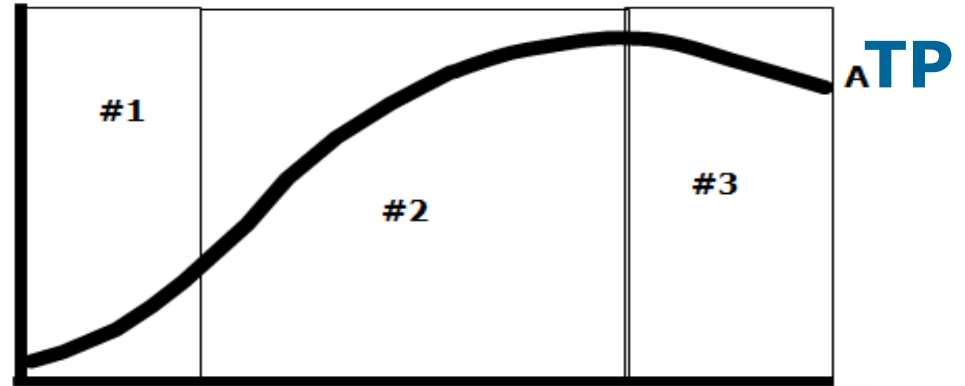
# The Production Function

<b>Input</b>	<b>Total Product</b>	<b>Marginal Product</b>	<b>Average Product</b>	
<b>1</b>	<b>10</b>	<b>+10</b>	<b>10</b>	
<b>2</b>	<b>24</b>	<b>+14</b>	<b>12</b>	
<b>3</b>	<b>39</b>	<b>+15</b>	<b>13</b>	
<b>4</b>	<b>52</b>	<b>+12</b>	<b>13</b>	
<b>5</b>	<b>60</b>	<b>+8</b>	<b>12</b>	
<b>6</b>	<b>66</b>	<b>+6</b>	<b>11</b>	
<b>7</b>	<b>63</b>	<b>-3</b>	<b>9</b>	
<b>8</b>	<b>56</b>	<b>-7</b>	<b>7</b>	

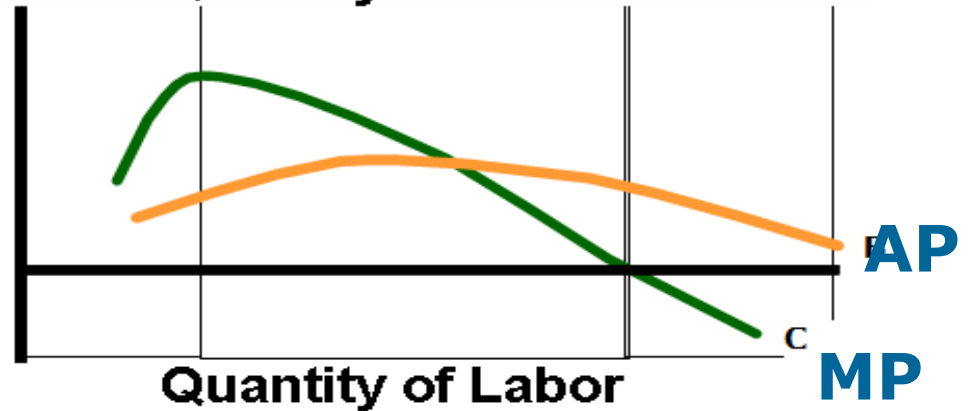
# Key Graph Parts to Remember:

- Stages follow MP
- AP intersects MP at its high point
- MP increases, decrease & then goes negative

Output



Quantity of Labor



Quantity of Labor



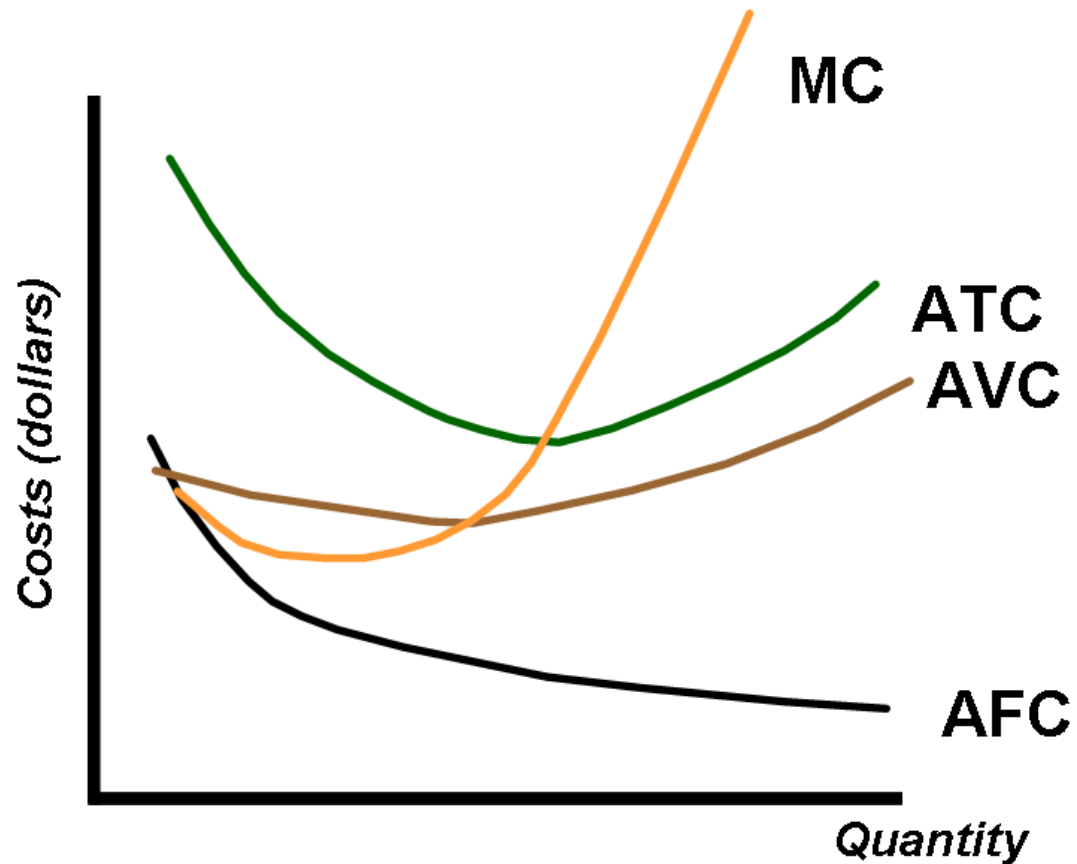
## 8. Law of Diminishing Returns

- Due to limited capacity, output will slow down and then decrease beyond a certain point



# Producer's Costs

- TFC: Total Fixed Costs
- AFC: Average Fixed Costs;  
 $TFC/q$
- AVC: Average Variable Costs;  
 $TVC/q$
- Marginal Costs  
 $\Delta TC$



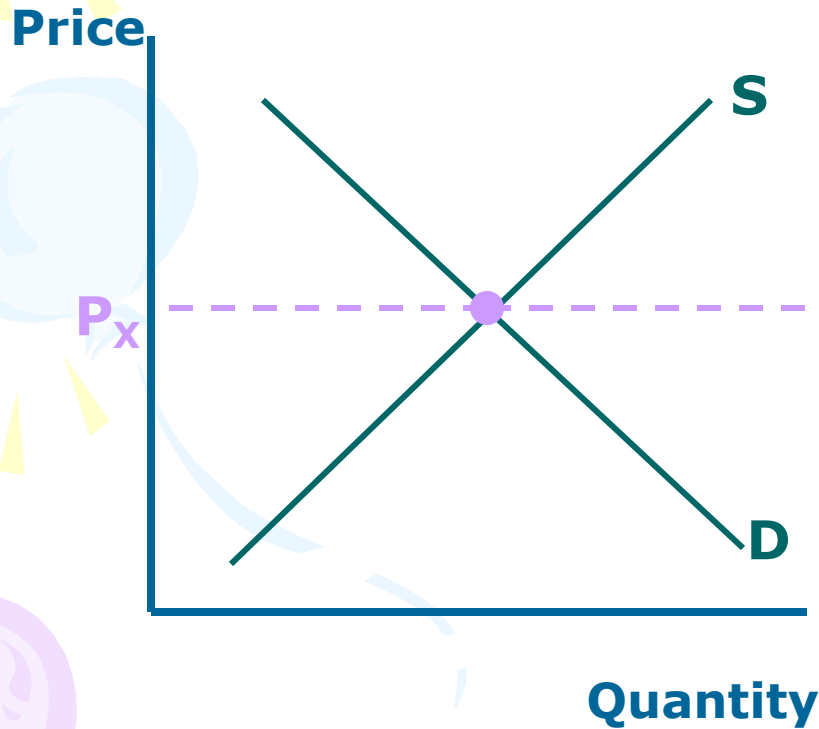


# Perfect Competition

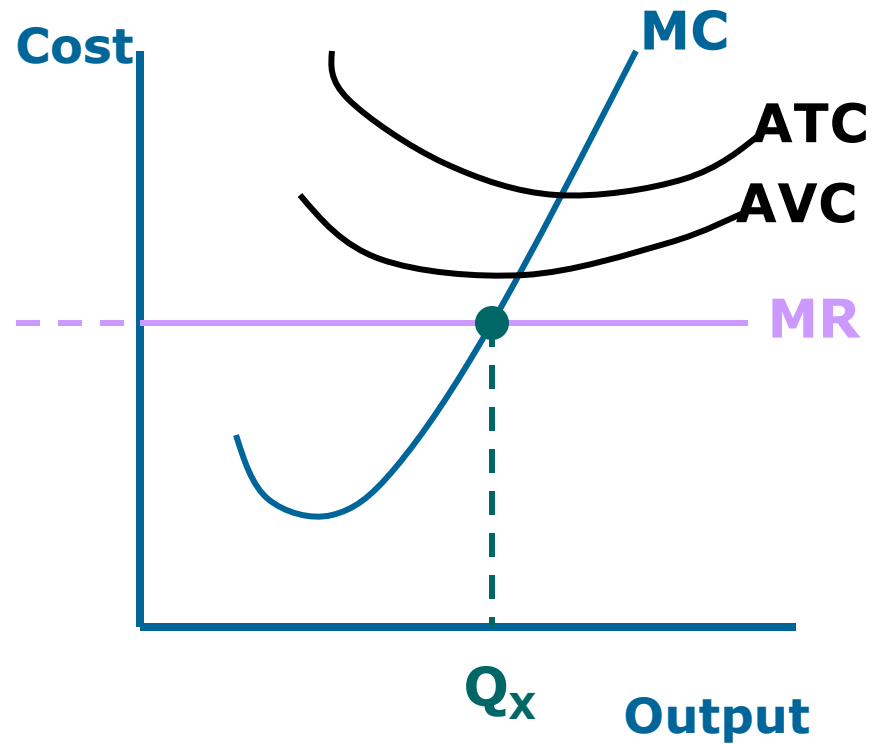
- Characteristics: many firms, homogenous products, no barriers to entry,  $P = MC = MR$
- Marginal Revenue: extra revenue gained with each additional unit of output;  $MR = \Delta TR$
- $P = d = MR$ : Price Takers, each firm takes market price (or market demand) so  $P$  and  $MR$  are constant (perfectly elastic & horizontal)

# Putting it all together

## Market (Industry)



## Firm






# More Questions

14. How can you tell if we are talking about long-run or short-run?

*Look for multiple short run graphs, look for LRAC, profit leads to expansion*

15. Profits in long run? Explain.

*Will lead to Long-Run Equilibrium where firms will no longer have economic profits (characteristics of market make long run profits impossible)*





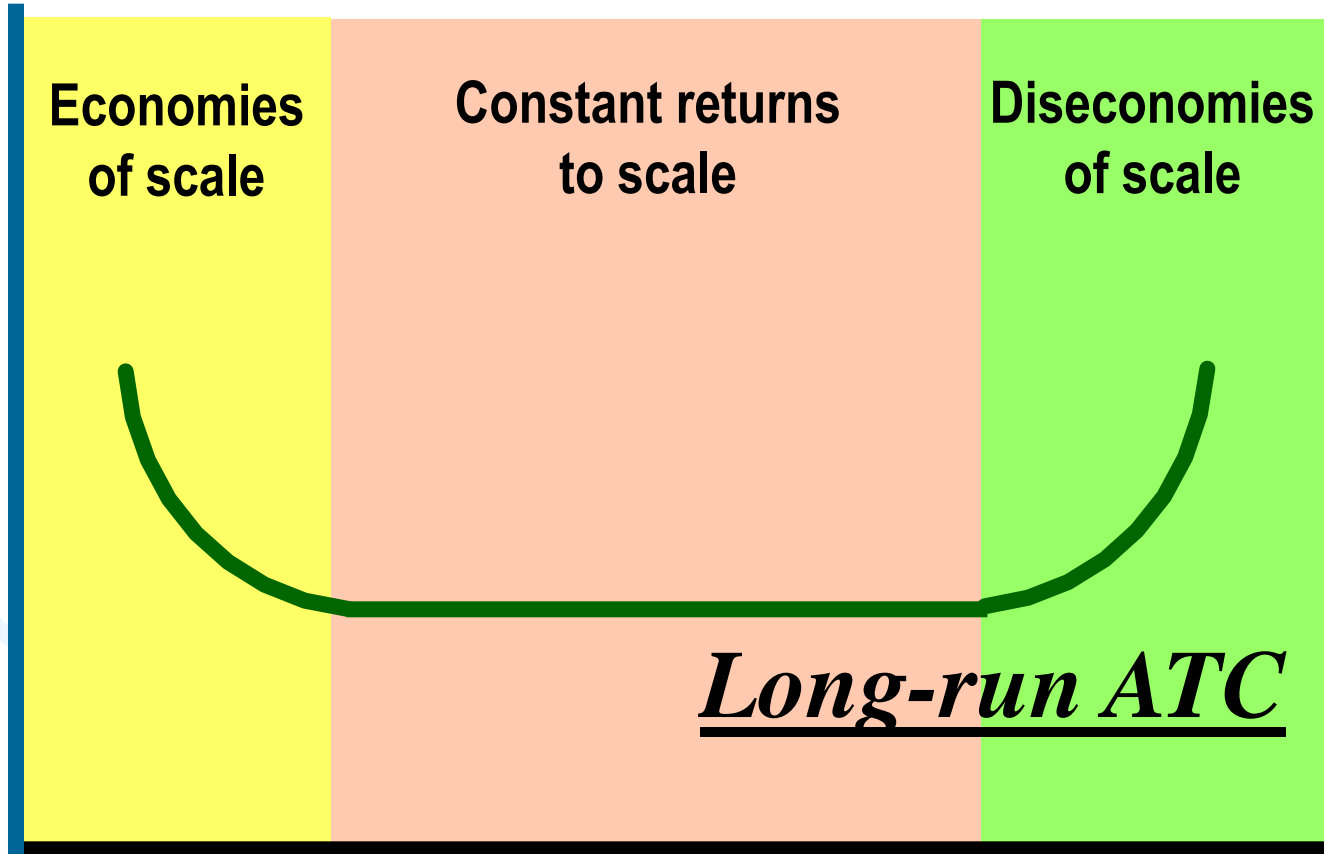
# Expanding Production

- Economies of Scale
  - LR, expand and more efficient (decrease costs)
- Diseconomies of Scale
  - LR, expand and less efficient (increase costs)
- Constant Return to Scale
  - LR, expand and costs are same per unit

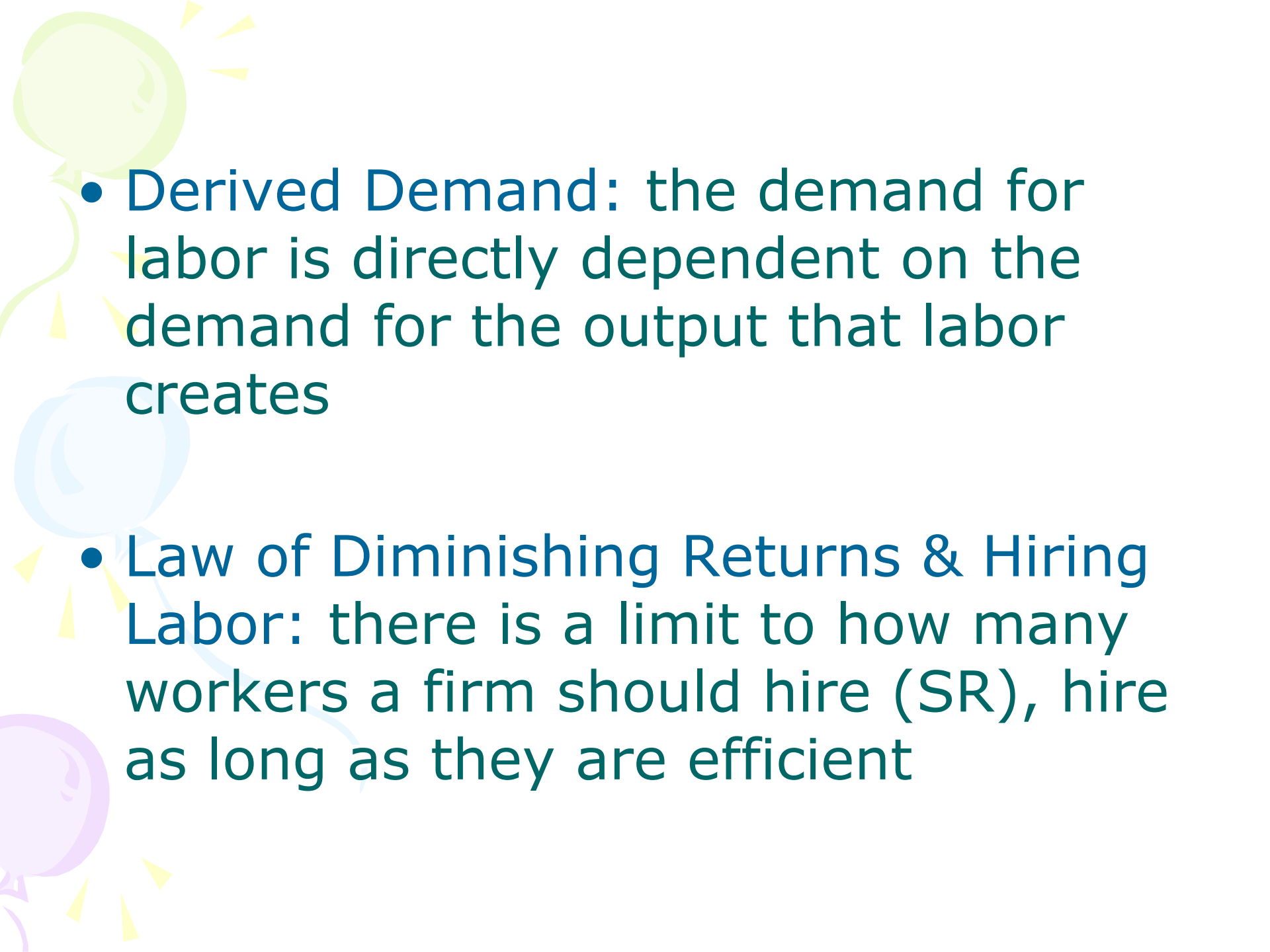
# Graphing Expansion

Firm

Unit Costs



Output

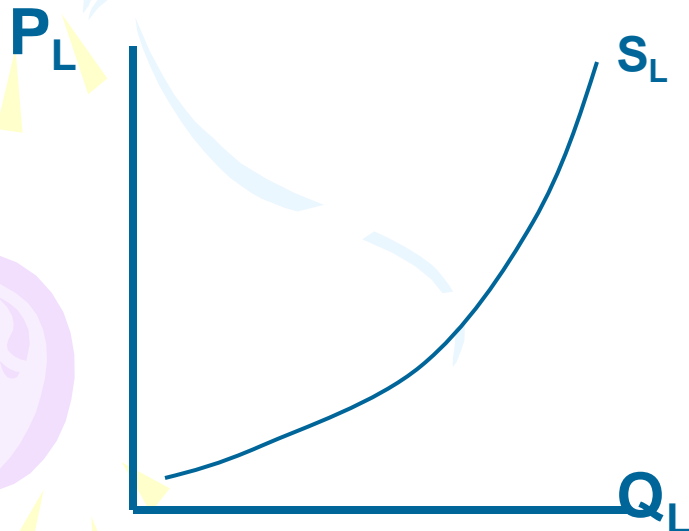
- 
- The slide features a decorative background on the left side with three balloons: a light green one at the top, a light blue one in the middle, and a light purple one at the bottom. Each balloon has a yellow streamer and several yellow triangular shapes radiating from it, resembling sunbeams or confetti.
- **Derived Demand:** the demand for labor is directly dependent on the demand for the output that labor creates
  - **Law of Diminishing Returns & Hiring Labor:** there is a limit to how many workers a firm should hire (SR), hire as long as they are efficient

# Income vs. Substitution

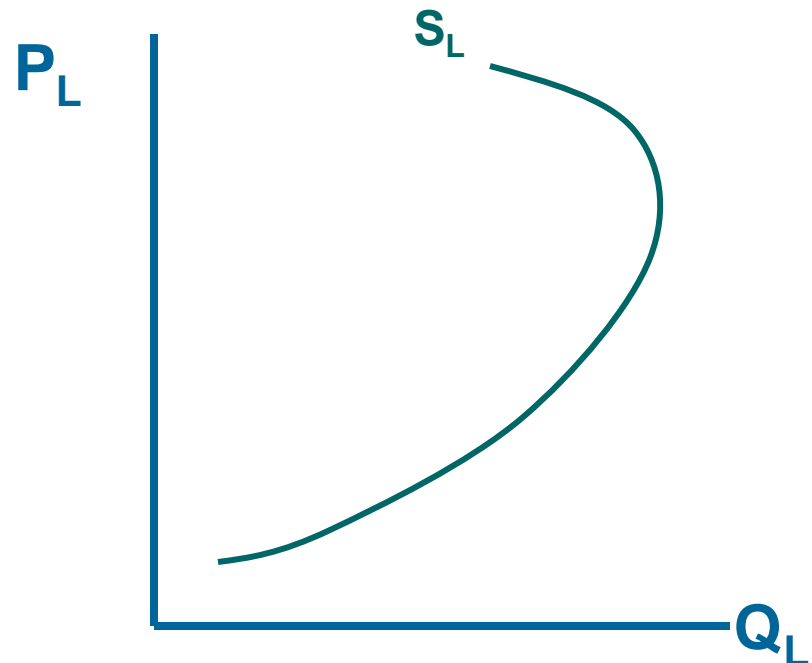
- Substitution Effect  
Choose to subs work for leisure to get more money

- Income Effect  
Choose current income with less work, want more leisure time

## Normal Supply Curve



## Backward Bending







- **Marginal Product of Labor: ( $MP_L$ )**

- The additional output produced as one more unit of labor is added

- **Marginal Revenue Product of Labor: ( $MRP_L$ )**

- The addition to the firm's revenue as the result of the marginal product per labor unit

- Represents the firm's demand curve for labor

# Marginal Resource Cost = Wage of Labor = Price of Labor

- $MRC = W_L = P_L$

- All refer to the cost of the input labor and are interchangeable.
- In a perfectly competitive labor market, the  $P_L$  comes from market and is a horizontal line for the firm
  - It is the supply curve of labor faced by the firm

# Example:

$P_L = \$60$  and  $P_X = \$10$

Labor (L)	Total Output (Q)	Marginal Product ( $MP_L$ )	Marginal Revenue Product ( $MRP_L$ )
1	5	+5	\$50
2	20	+15	\$150
3	30	+10	\$100
4	35	+5	\$50
5	35	+0	\$0

$$MP_L = \Delta \text{Output}$$

$$MRP_L = MP_L \times P_L$$

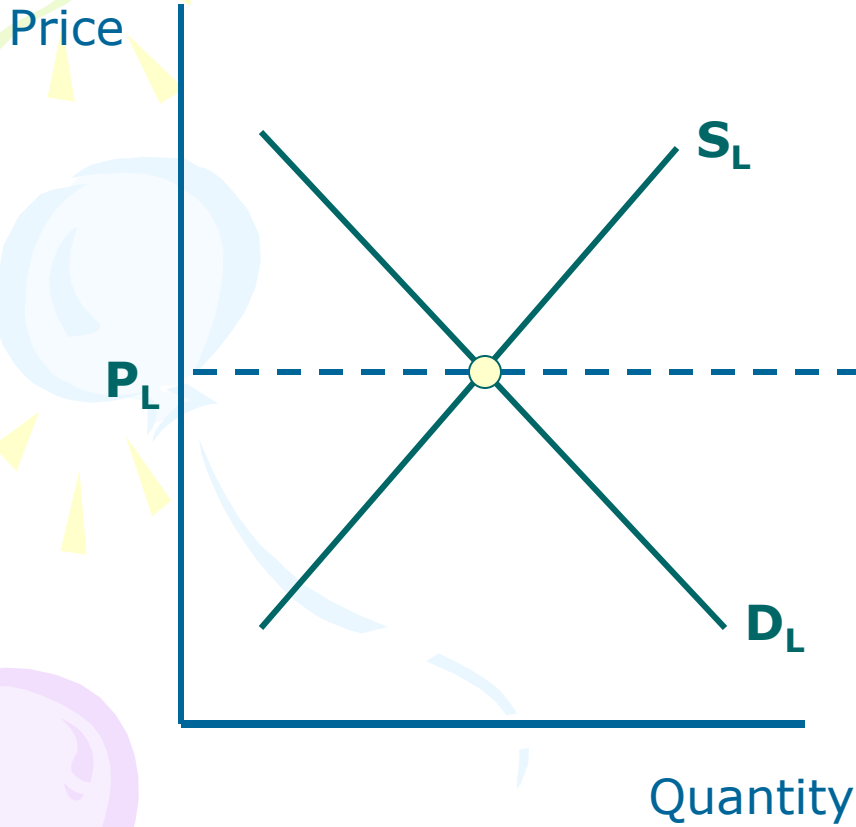
# How many workers should be hired?

- $P_L = \$60$

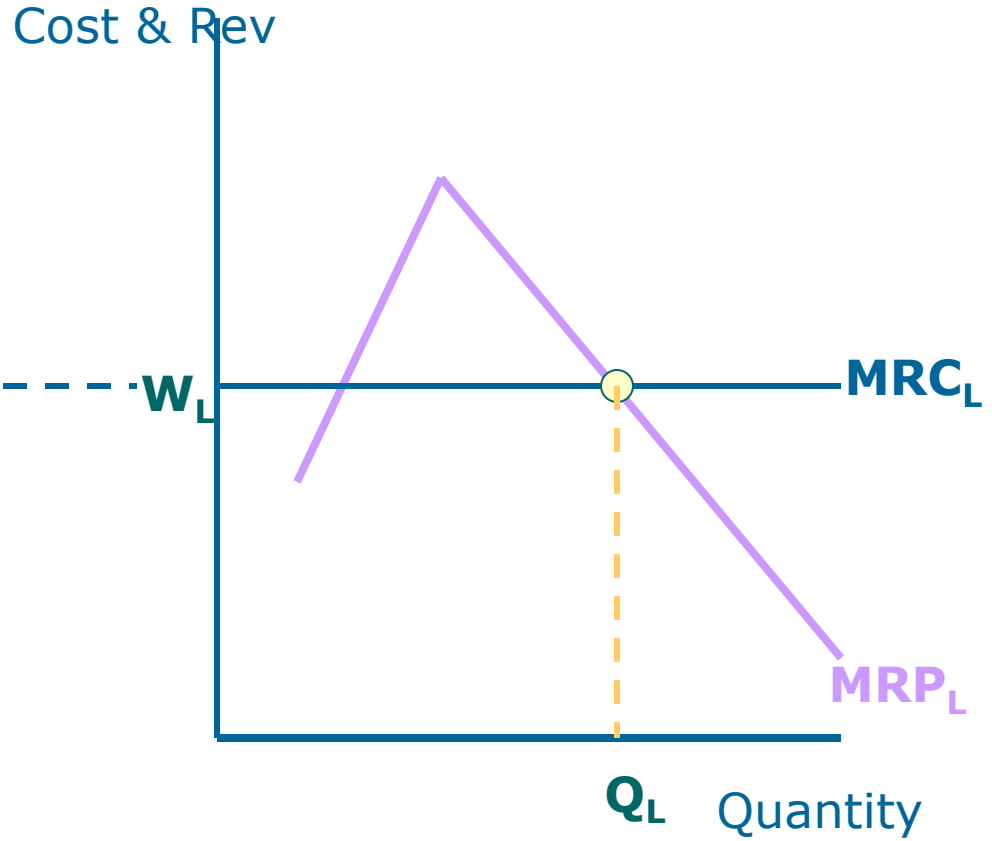
- The firm will hire 3 workers; any more and the additional cost will not cover the additional revenue earned; or  $MRP_L \geq MRC$ .

# Graph:

## Labor Market



## Firm





# Parts to Remember:

#1: MRC is the labor supply curve available to the firm

#2: MRP is the labor demand curve of the firm

#3: find where they intersect and that is the quantity of labor hired!!

$$(MC = MR)$$