### THE FUNCTION y = ax + b

- Linear equation with solution of more unknowns = linear function
- Consider the linear function y = ax + b. In this function:
- v is the dependent variable
- x is the independent variable
- a is the slope  $\rightarrow$  Shows the change in y for one-unit change in x,

i.e. 
$$a = \frac{\Delta y}{\Delta x}$$

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- b is the y-intercept  $\rightarrow$  Shows the value of y if x is 0
- x-intercept  $\rightarrow$  The x-intercept shows the value of x if y is 0,
  - i.e.  $x = -\frac{b}{a}$

- ELIMINATION 3 • Now you have a 200 2 system? P(S) = Z = PaSS...(4)
  - $\circ 7y 2z = -12 \dots (5)$
  - Now get rid of y
  - Multiply (4) by 7 and (5) by 3. The result is
  - $21y 7z = -56 \dots (4a)$
  - $21y 6z = -36 \dots$  (5a)

## • Demand and supply Malysis 47 • National Income 9

• IS-LM analysis

## **DEMAND AND SUPPLY ANALYSIS**

- Demand and supply are the Basic building blocks of economic analysis.
  - Demand by goods and services is based on the theory of consumer behaviour. Supply is based on the theory of the behaviour of the firm.
- Demand function: Relationship between quantity demanded and price, •
  - e.g.  $q^{d} = b ap$
  - The negative sign on a means that as price increase quantity demanded decreased. Thus, the market demand curve is negatively sloped.
- Supply function: relationship between quantity supplied and price,
  - e.g.  $q^{s} = cp + d$
  - The positive sign on c means that as price increase quantity supplied increase. Thus, the market supply curve is positively sloped.

**DEMAND AND SUPPLY ANALYSIS: EXAMPLES** 1. The demand and supply a sworelated goods, namely beef (1) and po (2), are  $p_1 = 82 - 3p_2$ ,  $p_2$ ;  $q_1^S = 15p_1 - 5$  and  $q_2^D = 92 + 2p_1 - 4p_2$ ;  $q_2^S = 32p_2 - 6$ .

Solve for the equilibrium prices,  $p_i$ , as well as the equilibrium quantities,  $q_i$ , (recall that in equilibrium,  $q_i^D = q_i^S$ ).

2. Consider the following system of equations, depicting the equilibrium conditions for three interdependent commodities:

$$2p_1 = 77 - 4p_2 - p_3$$
;  $3p_2 = 114 - 4p_1 - 7p_3$ ;  $3p_3 = 48 - 2p_1 - p_2$ .

Solve for  $p_1, p_2$  and  $p_3$ .

## AD VALOREM TAX EXAMPLE • The (inverse) demand for tobacco is $p = 80 - 5q^d$ , while the (inverse) supply of tobacco is $p = 30 - 5q^d$ , while the (inverse) supply of

- Suppose that the government decides to levy an ad valorem tax on the seller's tobacco, and that the rate at which tobacco is taxed is 15 percent of the supply (received) price.
- Find equilibrium price and quantity of tobacco before and after the tax.
- Also comment on the distribution of the tax burden.

# Solution: NATIONAL INCOME 2. • Saving: $S = (Y \overrightarrow{o} \overrightarrow{n}) \stackrel{\text{Notesale.Co.uk}}{F \overrightarrow{o} \overrightarrow{n}} \stackrel{\text{Option}}{42} \stackrel{\text{Option}}{4$

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$$S = 0.1(Y - T) - 220 = 0.1(Y - 0.3Y) - 220$$

- S = 0.07Y 220
- S = 0.07(6000) 220 = 200 > 0