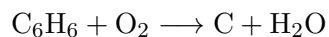
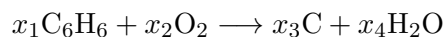


EX: [Chemical Equations] Liquid benzene ( $\text{C}_6\text{H}_6$ ) burns in the atmosphere ( $\text{O}_2$ ). If a cold object is placed over the benzene, a reaction occurs that results in water ( $\text{H}_2\text{O}$ ) and soot, i.e. Carbon ( $\text{C}$ ), forming on the object. The **unbalanced** chemical equation is given by



Since the atoms are neither created nor destroyed, the equation must be balanced by finding  $x_1, x_2, x_3$ , and  $x_4$  such that the total C, H, and O atoms on the LHS match the total on the RHS. i.e.



EX: [Traffic Flow] Construction causes the following traffic network (with one-way traffic). Determine the general flow for the network.

EX: [Economics] A primitive society currently barter 3 main goods: Food, Tools, and Clothing. The farmers keep 50% of the food themselves and give (i.e. trade) 30% to tool producers and 20% to clothing producers. The tool producers keep 30% of tools and give 35% to both food and clothing producers. The clothing manufacturers keep 40% of clothing and give 40% to the food producers and 20% to the tool producers.

The data can be summarized in the following

or Graphically

**Exchange Table:**

Food	Tools	Clothing	Traded To
.50	.35	.40	Food
.30	.30	.20	Tools
.20	.35	.40	Clothing

Now the society wants to introduce a monetary system and they want to know how to price the goods so that each group's expenses balances its income (i.e. equilibrium ).

Let

$x_1$  = price of food

$x_2$  = price of tools

$x_3$  = price of clothing

In order to be in equilibrium: Total Income = Total Expense

	Total Income	=	Total Expenses on		
			Food	Tools	Clothing
Food	$x_1$	=	$.50x_1$	$+ .35x_2$	$+ .40x_3$
Tools	$x_2$	=	$.30x_1$	$+ .30x_2$	$+ .20x_3$
Clothing	$x_3$	=	$.20x_1$	$+ .35x_2$	$+ .40x_3$

Homework: Section 1.6, p. 54: #7,9, 11, 13, 15, 3, 5

Read the Introduction to Chapter 1 (pp. 1-2) and write a paragraph summary.