1.1 Applications of Equations

Fixed cost is the sum of all costs that are independent of the level of production, such as rent, insurance, and so on. This cost must be paid whether or not output is produced. **Variable cost** is the sum of all costs that are dependent on the level of output, such as labor and material. **Total cost** is the sum of variable cost and fixed cost:

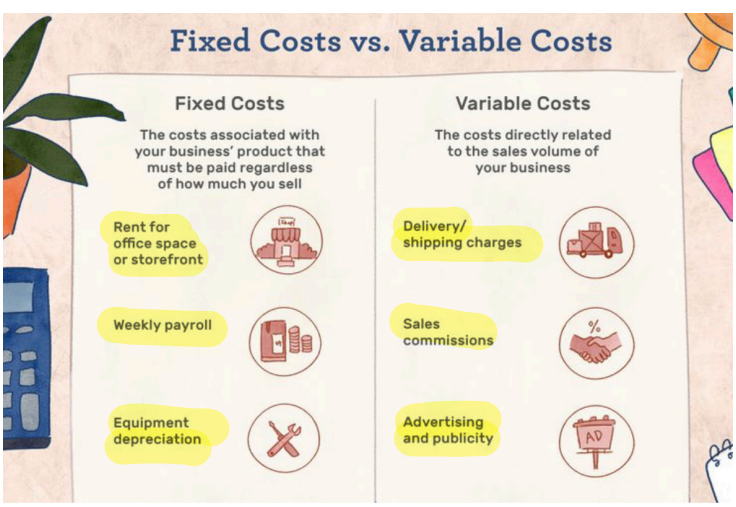
$$\text{total cost} = \text{variable cost} + \text{fixed cost}$$

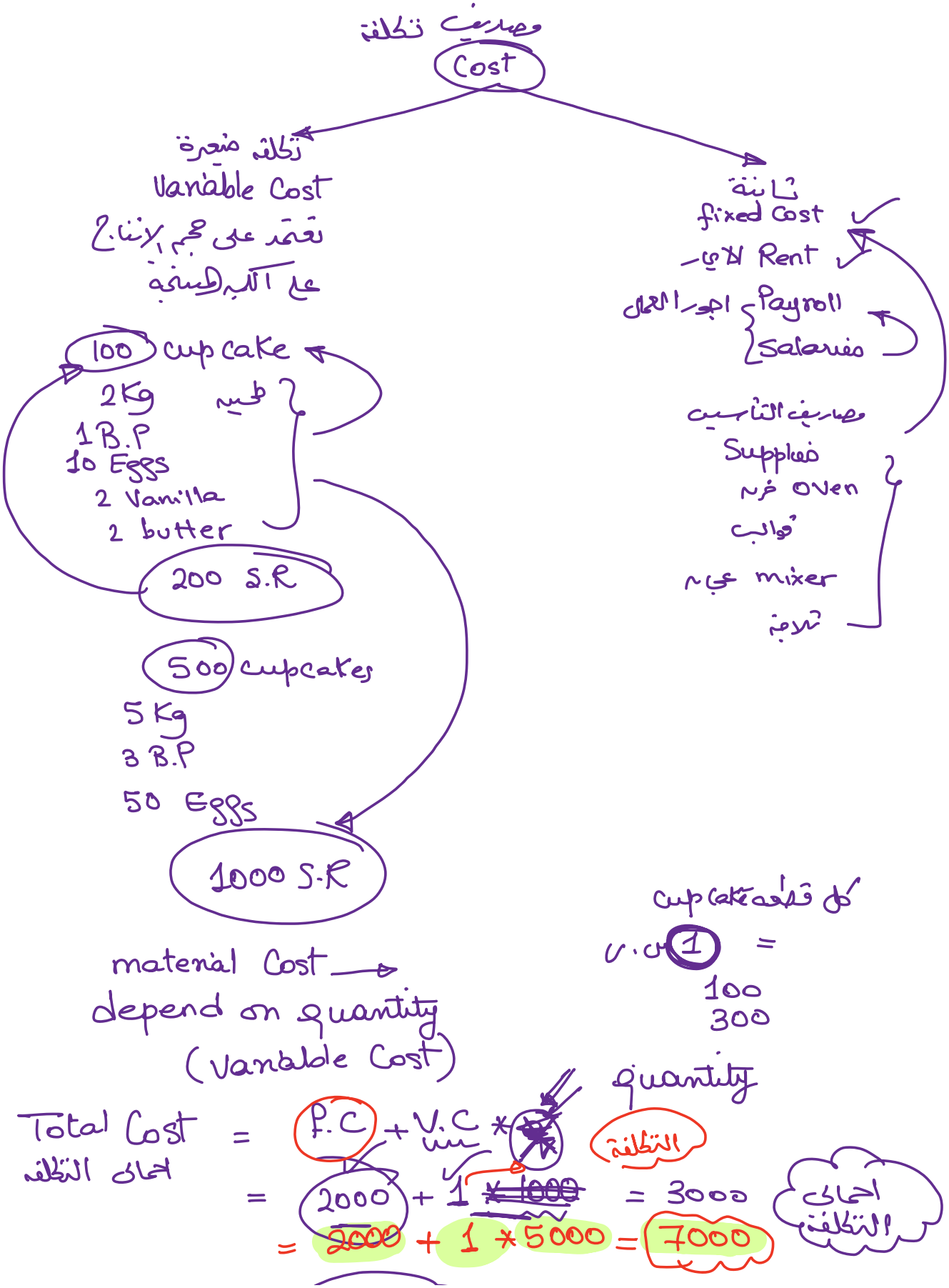
Total revenue is the money that the manufacturer receives for selling the output:

$$\text{total revenue} = (\text{price per unit})(\text{number of units sold})$$

Profit is total revenue minus total cost:

$$\text{profit} = \text{total revenue} - \text{total cost}$$




مصاريف تكلفة
Cost
تكلفة متغيرة
Variable Cost
تعتمد على حجم الإنتاج
على الكيك المصنع
ثابتة
fixed Cost
الإيجار Rent
اجور العمال Payroll
Salaries
مصاريف التأسيس
Supplies
فرن Oven
قوالب
عجان mixer
ثلاجة
100 cupcake
2Kg
1 B.P
10 Eggs
2 Vanilla
2 butter
طحين
200 S.R
500 cupcakes
5 Kg
3 B.P
50 Eggs
1000 S.R
material Cost
depend on quantity
(Variable Cost)
كل قطعة cupcake
ت.ث 1 =
100
300
quantity
Total Cost = F.C + V.C * 1
التكلفة
= 2000 + 1 ~~*1000~~ = 3000
= ~~2000~~ + 1 * 5000 = 7000
اجمالي التكلفة

quantity = 5000 قطعة cupcakes

Selling price = سعر البيع للقطعة الواحدة = 2 ر.س

Total Revenue = Selling price * q = 2 * 5000 = 10,000 الدخل

Profit = 10,000 − 7000 = 3000

Profit = T.R − T.C

1) T.C = f.C + v.C * q
التكاليف الكلية

2) T.R = Selling price * q ← الكمية المباعة
سعر البيع للقطعة الواحدة
اجمالي الدخل

3) Profit = T.R − T.C
الربح

→ Profit = Selling price * q − [f.C + v.C * q]
هذا الناتج صفر

4) Break even → profit = 0

~~Profit~~ = T.R − T.C

0 = T.R − T.C

T.C = T.R → f.C + v.C * q = Selling price q

Q 9: A corn refining company produces corn gluten cattle feed at a variable cost of $82 per ton. If fixed costs are $120,000 per month and the feed sells for $134 per ton, how many tons must be sold each month for the company to have a monthly profit of $560,000?

V.C = $82/ton

f.C = $120,000

Selling price = $134 / ton

عدد الطن المطلوب بيعه حتى يتم تحقيق ربح قدره $560,000

profit = $560,000

* Let number of tons = q

Profit = T.R − T.C

= Selling price * q − [f.C + v.C]

560,000 = 134 * q − [120,000 + 82 * q]

560,000 = 134q − 120,000 − 82q

560,000 = 52q − 120,000

560,000 + 120,000 = 52q

$\frac{680,000}{52} = \frac{52q}{52}$

q = 13076.923

≈ 13077 tons

Q 10. The pear-shaped Corporation would like to know the total sales units that are required for the company to earn a profit of $1,500,000. The following data are available: unit selling price of $550, variable cost per unit of $250, total fixed cost of $5,000,000. From these data, determine the required sales units.

profit = $ 1,500,000

Selling price = $550

V.C = $250

f.C = $ 5000000

Sales unit = ??

Let sales unit = q

Profit = T.R − T.C

= Selling price * q − [f.C + v.C]

1,500,000 = 550 * q − [5000000 + 250 * q]

1,500,000 = 550q − 5000000 − 250q

1,500,000 + 5000000 = 300q

$\frac{6,500,000}{300} = \frac{300q}{300}$

q = 21666.667

≃ 21667 units

Q 21. (in Arab edition Q # 19) A manufacturer of video games sells each copy for $21.95. The manufacturing cost of each copy for $14.92. Monthly fixed costs are $8500. During the first month of sales of a new game, how many copies must be sold in order for the manufacturer to break even?

Selling price = $21.95
V. Cost = $ 14.92
f.C = $ 8500

Break even → profit = 0

Let Number of units sold = q

To break even → profit = 0

T.C = T.R

f.C + v.C * q = Selling price * q

8500 + 14.92 * q = 21.95 * q

8500 = 21.95q − 14.92q

$\frac{8500}{7.03} = \frac{7.03q}{7.03}$

q = 1209.10

≃ 1209 units

To break even 1209 units must be sold