Contribution

- Data
  - Quantity sold: 5,000 units
  - Selling price per unit: £10
  - Variable cost per unit: £5
  - Fixed costs: £10,000

Contribution per unit = £10 - £5 = £5

Total Sales = 5,000 x £10 = £50,000
Total Variable Costs = 5,000 x £5 = £25,000
Total Contribution = £50,000 - £25,000 = £25,000

Profit = £25,000 - £10,000 = £15,000

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Breakeven

- Three methods of calculating breakeven level of output
- **A table** (or spreadsheet) showing sales and costs over different levels of output
- **A formula** which you can use to calculate breakeven output
- **A graph** which charts sales and costs

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Breakeven Table

Output '000	Sales £'000	Variable Costs £'000	Fixed Costs £'000	Total Costs £'000	Profit £'000
0	0	0	40	40	-40
1	10	4	40	44	-34
2	20	8	40	48	-28
3	30	12	40	52	-22
4	40	16	40	56	-16
5	50	20	40	60	-10
6	60	24	40	64	-4
7	70	28	40	68	2
8	80	32	40	72	8
9	90	36	40	76	14
10	100	40	40	80	20

breakeven occurs where contribution equals fixed costs = between 6,000 & 7,000 units

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Breakeven Formula

Contribution per unit = selling price per unit less variable cost per unit

In this example, contribution per unit = £10 less £4 = £6 per unit

Using the formula:
breakeven output (units) = Fixed costs (£) / Contribution per unit (£)

breakeven output = £40,000 divided by £6 = 6,666
Note: breakeven output is always expressed in terms of units

So breakeven output = 6,666 units

Tip: If the information is available, it is always quicker and easier to use a breakeven formula rather than use a table or draw a chart

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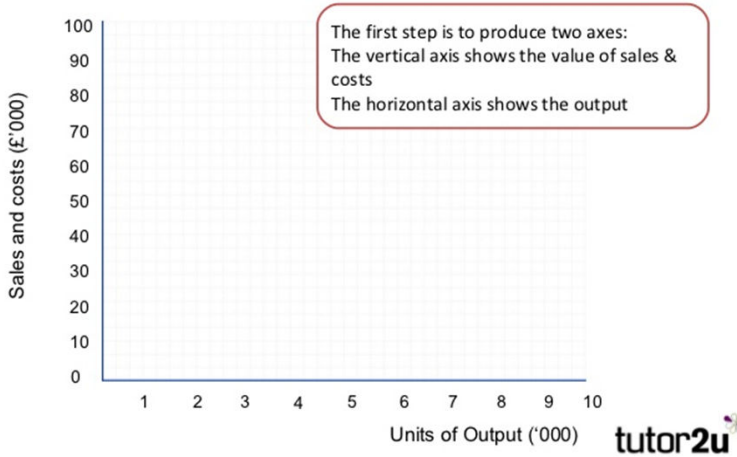
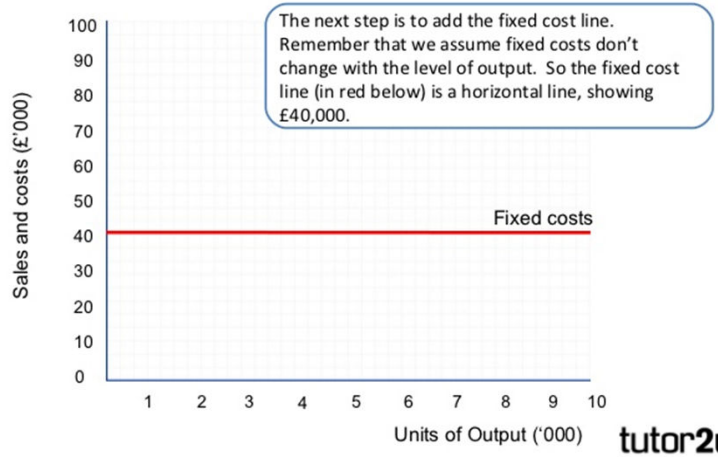
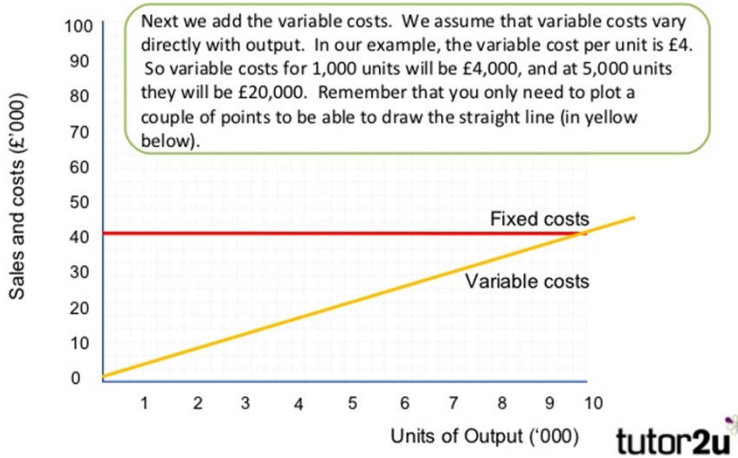
breakeven chart – Step 1



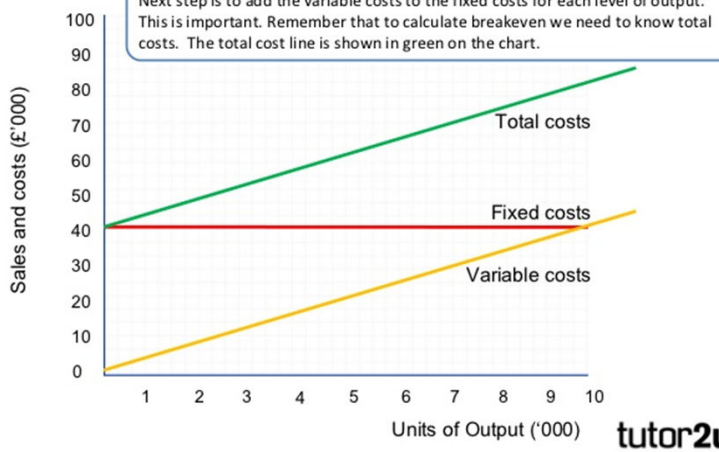
breakeven chart – Step 2



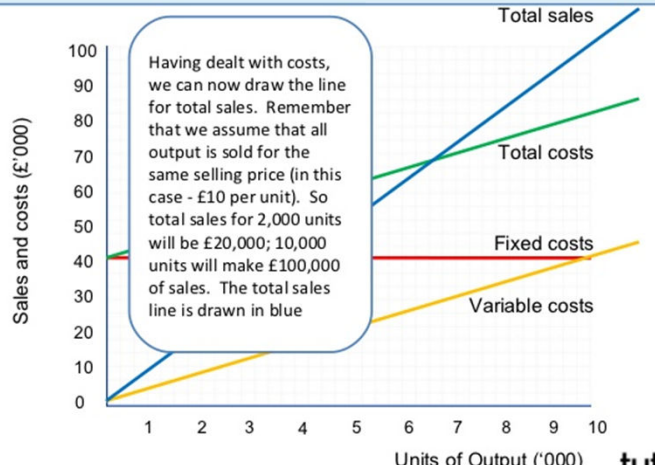
breakeven chart – Step 3



breakeven chart – Step 4



breakeven chart – Step 5



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breakeven chart – Step 6

The last step is to use these lines to identify certain information from the chart.

First, the breakeven output - the point where total sales = total costs. So the output is the point where the total sales line crosses the total costs line (e.g. where the blue line crosses the green line). Find this point on the chart and then follow a vertical line down to the output (horizontal) axis. You can see this brings us to 6,666

Another thing you can notice from the chart is the over a range of output, total costs are higher than total sales (green line higher than the blue line). That means that in this range, the business is making losses. This is the **loss-making range of output**.

If the actual output is more than the breakeven output, the business will be making a profit. In our example, any output more than 6,666 units will mean profits are earned.

The difference between the actual output and the breakeven output is known as the "margin of safety". For example, if actual output were 8,000 units, then the margin of safety = 8,000 units less 6,666 units = 1,334 units.

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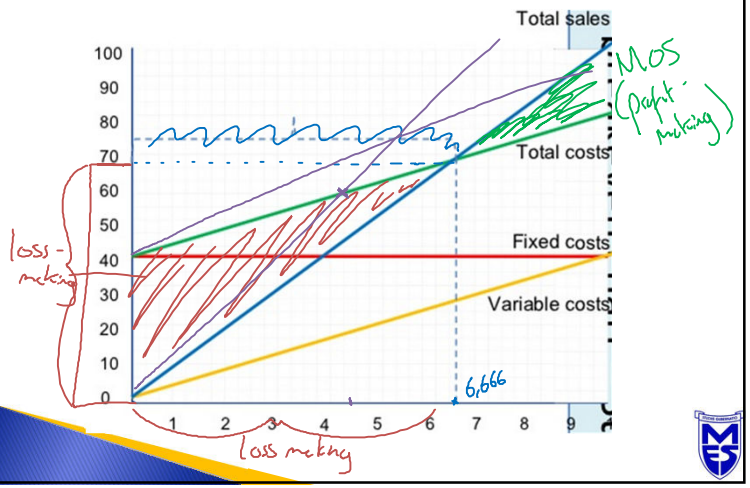
Breakeven Point



Effects on breakeven

Change	Effect on Contribution per Unit	Effect on breakeven Output
Higher selling price	Higher	Lower
Lower selling price	Lower	Higher
Higher variable cost per unit	Lower	Higher
Lower variable cost per unit	Higher	Lower
Increase in fixed costs	No change	Higher
Decrease in fixed costs	No change	Lower

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Strengths of breakeven analysis

Strengths

Focuses on how long it will take before a start-up reaches profitability – the required output

Helps entrepreneur & finance-providers better understand the viability and risk of a business idea

Margin of safety calculation shows how much a sales forecast can prove over-optimistic before losses are incurred

Illustrates the importance of keeping fixed costs down to a minimum

Calculations are quick and easy

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Limitations of breakeven analysis

Limitations

Unrealistic assumptions – products are not sold at the same price at different levels of output; fixed costs **do** vary when output changes

Sales are unlikely to be the same as output – there may be some build up of stocks or wasted output too

Variable costs do not always stay the same. For example, as output rises, the business may benefit from being able to buy inputs at lower prices (buying power)

Most businesses sell more than one product

A planning aid rather than a decision-making tool

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Breakeven analysis: key assumptions

- In order to do breakeven analysis, you have to make some important assumptions
  - Selling price per unit stays the same, regardless of the amount produced
  - Variable costs vary in direct proportion to output – i.e. variable cost per unit is the same
  - All output is sold
  - Fixed costs do not vary with output – they stay the same
- These assumptions are not always realistic – a key limitation of breakeven analysis

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The Margin of Safety

The difference between a firm's actual sales volume and the quantity needed to break even. The larger the difference, the 'safer' the firm is.

MOS = D – BE quantity

Expressed in UNITS

Try activity 5.3.2 (561)