Supplement: The accounts of manufacturing businesses

Aim of the chapter

To extend the knowledge and skills acquired in chapters 6 to 9 to cover the preparation of a profit and loss account and balance sheet for a manufacturing business.

Learning outcomes

After reading the chapter and completing the related exercises, students should:

- Understand the distinctions between 'raw materials', 'work in progress' and 'finished goods' stock.
- Be able to calculate cost of sales for a manufacturing business.
- Be able to prepare the profit and loss account and balance sheet for a manufacturing business.

Manufacturing businesses

So far, in this section of the book, we have used examples of sole trader businesses engaged principally in selling goods or services. The accounts of businesses engaged in manufacturing are a little more complicated because such businesses typically buy in raw materials, put them through a manufacturing process and produce finished goods for sale. The calculation of cost of sales involves some additional steps in order to ensure that all costs are included. However, items of expenses deducted from gross profit are treated in the same way as for traders selling goods or services, so many aspects of the accounts preparation remain the same, and should be quite familiar by now.

First, we will look at an example of a manufacturing business in order to think through the processes involved and to become familiar with some of the terminology used in describing accounting in a manufacturing environment.

Example 1

Anna runs a small business making components for self-assembly furniture kits. She buys in **raw materials** in the form of different types and grades of wood, medium density fibreboard, hardboard and metals. Anna's employees then process the raw materials using various machines in order to produce **finished goods**, which she then sells to her customers. Her customers are mainly large retailers who source their flat-pack furniture from many different manufacturers. Anna herself does not sell directly to the public.

Anna's production falls into two categories. Most of her goods are produced to fulfil specific large orders from customers. However, she also keeps a finished goods stock of small components which are in general demand. Production for specific orders usually takes priority, but in slack periods Anna's small factory can be kept busy in the production of the smaller, generic components.

At any point in time, Anna's factory contains three categories of stock:

- **Raw materials**, which are waiting to enter the production process.
- **Finished goods**, either awaiting shipment to customers or kept in stock against possible future orders.
- **Work-in-progress**, which comprises partly processed materials.

Calculating cost of sales

In the examples provided so far in this book, cost of sales has been arrived at by the following calculation:

Opening stock + Purchases − Closing stock = Cost of sales

Where, as in the case of Anna's factory, there are three categories of stock, the calculation of cost of sales inevitably becomes more complicated. The valuation of raw materials stock is usually straightforward, and is based on the cost of the materials.

However, once raw materials enter production, their value is increased by the various processes that they are subjected to. How is this additional value calculated?

In the next example, we will examine Anna's production process in more detail.

Example 2

Anna's factory contains several machines such as lathes, cutting machines and presses. She employs four members of staff to operate the various machines, and a production supervisor who is responsible for ensuring that production runs smoothly. What costs are involved in the production process? How do we arrive at the cost of finished goods?

1. *Materials costs*: the cost of raw materials put into the production process form part of the overall cost of the finished goods.
2. *Labour costs*: the cost of wages paid to the production workers forms part of the overall cost of the finished goods.
3. *Production overheads*: these comprise any additional costs of production, including such items as the cost of time spent in supervising production, the cost of electricity for running the factory, and the depreciation charges relating to the machinery used in production.

It is necessary to take all three categories of cost into account in order to calculate the overall cost of finished goods, and the cost of sales. (Note that in Part III of this book we will examine costing in much greater detail.)

In addition to these cost categories there are all the other costs that a business usually incurs: for example, administration costs such as phone bills, cost of employing office staff, accountancy and legal fees and salespersons' salaries. Such costs are not related to production; they are expenses that are deducted from gross profit.

? Self-test question 1 (answer at the end of this document)

Billy has a factory that manufactures children's toys. Next door to the factory premises is a small office where Billy's secretary keeps the paperwork in order, and where the sales force of two people is based. Billy's business incurs costs in the following categories:

- purchase of wood for making toys
- depreciation of factory machinery
- employee costs – machine operators
- production supervisor's salary
- electricity bill for factory
- electricity bill for office
- depreciation of office equipment
- telephone bill
- delivery van expenses

- secretary's salary
- purchase of plastics for making toys
- purchase of paper for office computer
- purchase of toy packaging.

Place each item in one of the following categories:

- materials cost
- labour cost
- production overheads
- administration and selling expenses.

Direct and indirect costs

Direct costs are those costs that are clearly identifiable with the items produced. For example, Anna receives an order for 500 wardrobe door fittings, each to be packaged in its own plastic bag. In order to produce these she needs 16kg of metal that costs £5.00 per kilo, and 500 plastic bags at 0.25p each. The metal will be processed through a machine. To produce 500 fittings an employee will spend two hours on machine processing. The cost of employing one employee for an hour for this quite skilled work is £6.50. In addition, another employee, employed at £5.40 per hour, will spend one hour at the end of the process putting the goods into the plastic bags.

The material and labour costs involved are **direct costs** in that they are clearly linked to the number of items produced. If Anna received an order for 1000 wardrobe door fittings the overall direct cost could be expected to be twice as much as for 500 fittings. This can be demonstrated as follows:

Table 1

	Direct costs for 500 fittings	*Direct costs for 1000 fittings*
Raw materials – metal	16kg × £5.00 = £80	32kg × £5.00 = £160
Labour – processing	2 hours @ £6.50 = £13.00	4 hours @ £6.50 = £26.00
Raw materials – packing	500 × 0.25p = £1.25	1000 × 0.25p = £2.50
Labour – packing	1 hour @ £5.40 = £5.40	2 hours @ £5.40 = £10.80
Total direct costs	£80 + £13.00 + £1.25 + £5.40 = £99.65	£160 + £26.00 + £2.50 + £10.80 = £199.30

The total figure for direct costs is commonly known as **prime cost**. The most commonly found direct costs are direct materials and direct labour. However, occasionally, other **direct expenses** are incurred.

Indirect costs are those that cannot be clearly linked to the items produced. For example, the cost of heating and lighting for the factory for one day remains the same regardless of how many items are produced during that day.

The value of finished goods stock contains a combination of direct and indirect costs. Work-in-progress stock is stock that is part way through the manufacturing process. Its value also contains a combination of direct and indirect costs, the amount of which depends upon how far it has proceeded through the production process. For example, suppose that at Anna's year-end, on 31 March 20X3, an order for 500 wardrobe fittings of the type shown in the example above had been partly completed. The fittings had been through the machine process but had not yet been packaged. The direct cost value of the work-in-progress would comprise only the cost of the metal raw material plus the cost of the labour to put it through the manufacturing process. Packaging material and labour costs would be excluded. The direct cost value would be (from the table above): £80 + £13 = £93 (for 500 wardrobe fittings). An additional estimate of indirect cost would also be added to arrive at a total value for the work-in-progress of wardrobe fittings.

The manufacturing account

In order to be able to calculate cost of sales in a manufacturing business it is necessary to work out manufacturing cost. A manufacturing account is used to calculate the total cost of producing finished goods during the accounting period.

A typical manufacturing account layout is shown below:

	£	£	£
Direct costs			
Direct materials			
Opening stock of raw materials	X		
Add: purchases of raw materials	X		
	X		
Less: closing stock of raw materials	(X)		
		X	
Direct labour		X	
Direct expenses		X	
Total direct costs (prime cost)			X
Production overheads (indirect costs)			
e.g. Depreciation of factory machinery		X	
e.g. Factory supervisor		X	
e.g. Factory rental		X	
e.g. Factory machinery repair and maintenance		X	
Total production overheads			X
Add: opening work-in-progress			X
Less: closing work-in-progress			(X)
Factory cost of finished goods			X

Note: it is important to remember to adjust the totals to take account of work-in-progress.

The next example shows the relevant figures for Anna's businesses and demonstrates how they are combined to form the manufacturing element of the accounts, and how that element fits together with the profit and loss account.

Example 3

Anna produces accounts to 31 March each year. At 31 March 20X3 she had the following balances relating to income and costs in her books:

	£
Depreciation of delivery vans	7 567
Office insurance	1 694
Factory workers' wages	47 350
Telephone	2 690
Accountancy and tax advice	1 500
Production manager's salary	16 750
Factory insurance	6 360
Office rental and business rates	7 520
Factory rental and business rates	30 610
Depreciation of office equipment	530
Maintenance and repair of machinery	1 750
Factory electricity	12 690
Secretarial costs	6 003
Delivery charges	16 760
Purchases of raw materials	91 004
Sales of finished goods	297 070
Office electricity	860
Sundry office expenses	2 034
Factory security services	2 166
Factory machinery depreciation	16 152

Opening stock at 1 April 20X2 was:

	£
Raw materials	7 593
Work-in-progress	1 675
Finished goods	16 240

Closing stock at 31 March 20X3 was:

	£
Raw materials	8 177
Work-in-progress	1 260
Finished goods	17 960

You are required to prepare a manufacturing account, and a profit and loss account for Anna for the year ending 31 March 20X3.

Step 1: Identify those items relating to the manufacturing account

In previous chapters we have allocated items in a given list of balances to trading account, profit and loss account or balance sheet. In this case we are not required to prepare a balance sheet, but we need to identify which items belong to the manufacturing account, and which to the trading account and profit and loss account. Remember that the costs for inclusion in the manufacturing account are those of direct materials, labour and expenses, and indirect production overheads. All costs relating to administration, selling and distribution are included in the profit and loss account.

	£	Category
Depreciation of delivery vans	7 567	Profit and loss account
Office insurance	1 694	Profit and loss account
Factory workers' wages	47 350	Manufacturing account – direct labour
Telephone	2 690	Profit and loss account
Accountancy and tax advice	1 500	Profit and loss account
Production manager's salary	16 750	Manufacturing account – indirect production overheads
Factory insurance	6 360	Manufacturing account – indirect production overheads
Office rental and business rates	7 520	Profit and loss account
Factory rental and business rates	30 610	Manufacturing account – indirect production overheads
Depreciation of office equipment	530	Profit and loss account
Maintenance and repair of machinery	1 750	Manufacturing account – indirect production overheads
Factory electricity	12 690	Manufacturing account – indirect production overheads
Secretarial costs	6 003	Profit and loss account
Delivery charges	16 760	Profit and loss account
Purchases of raw materials	91 004	Manufacturing account – direct materials
Sales of finished goods	297 070	Trading account
Office electricity	860	Profit and loss account
Sundry office expenses	2 034	Profit and loss account
Factory security services	2 166	Manufacturing account – indirect production overheads
Factory machinery depreciation	16 152	Manufacturing account – indirect production overheads

Step 2: Produce manufacturing account

Anna: Manufacturing account for the year ending 31 March 20X3

	£	£	£
Direct costs			
Direct materials			
Opening stock	7 593		
Add: purchases	91 004		
	98 597		
Less: closing stock	(8 177)		
		90 420	
Direct labour		47 350	
Total direct costs (prime cost)			137 770
Production overheads (indirect costs)			
Production manager's salary		16 750	
Factory insurance		6 360	
Factory rental and business rates		30 610	
Maintenance and repair of machinery		1 750	
Factory electricity		12 690	
Factory security services		2 166	
Factory machinery depreciation		16 152	
Total production overheads			86 478
Add: opening work-in-progress			1 675
Less: closing work-in-progress			(1 260)
Factory cost of finished goods			224 663

Note the adjustment for work-in-progress. Opening work-in-progress is a collection of costs brought into the current accounting period. Closing work-in-progress is the total of costs carried into the next accounting period.

Step 3: Produce profit and loss account, including trading account

Anna: Profit and loss account for year ending 31 March 20X3

	£	£
Sales		297 070
Less: cost of sales		
Opening stock of finished goods	16 240	
Add: factory cost of finished goods		
[from manufacturing account]	224 663	
	240 903	
Less: closing stock of finished goods	(17 960)	
Cost of sales		(222 943)
Gross profit		74 127

	£	£
Expenses		
Depreciation of delivery vans	7 567	
Office insurance	1 694	
Telephone	2 690	
Accountancy and tax advice	1 500	
Office rental and business rates	7 520	
Depreciation of office equipment	530	
Secretarial costs	6 003	
Delivery charges	16 760	
Office electricity	860	
Sundry office expenses	2 034	(47 158)
Net profit		26 969

Improving presentation

The expenses in Anna's profit and loss account are listed in the same order as in the list of balances. However, it might be helpful to a reader of the accounts to have the expenses categorised in order to improve the quality of the information supplied. In this case, for example, two appropriate categories might be (a) selling and distribution expenses, and (b) administration expenses. Allocation to these two categories would give the following result:

Expenses	£	£
Selling and distribution		
Depreciation of delivery vans	7 567	
Delivery charges	16 760	
		24 327
Administration expenses		
Office insurance	1 694	
Telephone	2 690	
Accountancy and tax advice	1 500	
Office rental and business rates	7 520	
Depreciation of office equipment	530	
Secretarial costs	6 003	
Office electricity	860	
Sundry office expenses	2 034	
		22 831
		47 158

Note that the figures do not change at all, but there is an improvement in the presentation of the information.

? Self-test question 2 (answer at the end of this document)

Ollie runs a small manufacturing business making components for the motor industry, trading as Brightwell Components. The following is a list of his account balances relating to income and costs for the accounting year ending 31 August 20X4.

	£
Depreciation of factory machinery	10 493
Accountancy and tax advice	1 200
Purchases of raw materials	78 439
Office insurance	3 442
Salespersons' salaries	24 410
Factory rental	23 700
Sales	341 115
Electricity and gas for factory	9 942
Office rental	6 344
Sundry selling expenses	827
Telephone – salespersons	2 492
Secretarial costs	9 314
Electricity – office	1 824
Factory insurance	3 773
Depreciation – factory computer	1 220
Repairs and maintenance to factory machinery	3 111
Production supervisory salaries	25 471
Delivery charges	17 270
Telephone – administration	1 720
Office sundry expenses	714
Factory sundry expenses	234
Factory wages	81 479

Opening stock at 1 September 20X3 was:

Raw materials	13 210
Work-in-progress	2 511
Finished goods	26 700

Closing stock at 31 August 20X4 was:

Raw materials	12 994
Work-in-progress	2 145
Finished goods	29 363

You are required to prepare a manufacturing account, and a profit and loss account for Brightwell Components for the year ending 31 August 20X4. Classify the expenses in the profit and loss account under two headings (a) selling and distribution expenses, and (b) administration expenses.

Manufacturing companies – including the balance sheet

The case study for this chapter starts on page 30. It provides a comprehensive example of accounting for a manufacturing concern, including the preparation of the manufacturing account, the profit and loss account and the balance sheet. All of the adjustments encountered in previous chapters – for example, accruals and prepayments, depreciation and amortisation, and adjustments for sales and purchases returns – are likely to occur in manufacturing accounts. The example in the case study includes several categories of adjustments. It may, therefore, look complicated at first sight, but there is no new material in it and students who have understood the book up to this point should have no difficulty in following the example.

Chapter summary

This chapter has introduced some new accounting terminology relating to stocks and manufacturing businesses. The layout of a typical manufacturing account has been introduced, and a comprehensive example and the case study show how the account integrates with the profit and loss account.

The case study incorporates both accounting for a manufacturing business and several of the accounting adjustments that were covered in chapters 6 to 9. The details of the case required advice about employment of staff, which involves consideration of finance, personnel and general business issues.

A manufacturing account is a relatively complex statement, and practice will be needed before students can feel secure about their ability to prepare and understand one. The questions that follow in the 'Exercises' section include many examples of manufacturing accounts involving progressive degrees of difficulty.

Please note, a multiple choice quiz based on this supplementary chapter is available on the student's side of this website.

Exercises: answers available to students at the end of this document

1 Amber runs a small factory making hats. She employs several people who are directly engaged in hat production, as well as a supervisor and a couple of clerks who deal with sales orders, invoices and related paperwork. Amber's business includes costs in the following categories:

- purchase of felt for hat-making
- factory rental payments
- factory supervisor's wages
- clerk's wages
- depreciation of sewing machines used in hat-making
- telephone bill
- factory electricity bill
- employee costs – hat-makers
- purchase of feathers, beads and sequins for trimming hats
- depreciation of office computer
- factory insurance
- delivery costs.

Place each of the above items in one of the following categories:

- direct materials
- direct labour
- production overheads
- administration and selling expenses.

2 Rufus runs a small business manufacturing high quality artists' pencils which are sold in boxed sets. His costs include the following:

- factory supervisor's wages
- accountancy and tax advisory fees
- purchase of cedarwood for pencils
- business rates on factory and offices
- factory cleaning expenses
- insurance of factory and offices
- factory heating costs
- payments to lathe and machine operators

- purchase of colour pigments
- sales administrator's salary.

Place each of the items above in one or more of the following categories:

- direct materials
- direct labour
- production overheads
- administration and selling expenses.

3 Bob runs a manufacturing business. Included in his books are the following balances relating to the costs of running his business for the year ending 30 November 20X4:

	£
Raw materials purchase	26 540
Depreciation of plant and machinery	4 333
Factory supervisor's salary	12 004
Factory rental	8 327
Opening stock of raw materials	3 433
Closing stock of raw materials	3 221
Electricity – factory	3 522
Machine operatives' wages	19 366
Factory insurance	4 002

What is the total prime cost for inclusion in Bob's manufacturing account for the year ending 30 November 20X4?

a) £45 906

b) £57 910

c) £58 122

d) £46 118.

4 Carrie runs a shoe factory and is about to prepare a manufacturing account for the month of May 20X6. The following balances are relevant:

	£
Production supervisor's salary	15 760
Maintenance of factory machinery	2 994
Purchase of raw materials	76 892
Machine operatives' labour costs	93 330
Factory cleaner's wages	7 400
Depreciation of freehold factory building	5 600
Stock of raw materials at 1 May 20X6	7 492
Stock of raw materials at 31 May 20X6	8 441
Stock of work-in-progress at 1 May 20X6	1 101
Stock of work-in-progress at 31 May 20X6	1 004

	£
Factory insurance	4 654
Electricity for factory	10 333
Sundry factory costs	1 808
Depreciation of machinery	6 667

Prepare Carrie's manufacturing account for May 20X6.

5 Stacey's factory makes plastic toys. Included in her books are the following balances relating to her accounting year ending 30 April 20X6:

	£
Machinery repair costs	1 779
Factory insurance	7 260
Raw materials purchases returns	1 727
Business rates	8 000
Stock of raw material 1 May 20X5	25 850
Machine operators' wages	132 630
Factory cleaning and security	6 860
Factory manager's salary	32 066
Work-in-progress 1 May 20X5	2 828
Stock of raw material 30 April 20X6	27 777
Other factory expenses	18 288
Purchases of raw materials	200 883
Factory supervisors' salaries	42 421
Work-in-progress 30 April 20X6	1 384

Notes:

1. The factory building cost £200 000 several years ago. It is depreciated on the straight line basis at 2% per year.
2. The factory machinery is depreciated at 15% per year on the reducing balance basis. The net book value at 1 May 20X5 was £105 250. During the year ending 30 April 20X6 there have been no disposals of factory machinery, but a new plastics moulding machine was bought at a cost of £7 250.
3. The depreciation expenses noted in 1 and 2 above must be included as part of production overheads.
4. Of the factory insurance of £7260, £400 relates to the next accounting period and should be dealt with as a prepayment.
5. The business rates of £8000 cover both the factory and the administration office. 90% of the rates bill relates to the factory.

Prepare a manufacturing account for Stacey for the year ending 30 April 20X6.

6 Cornelius runs a small factory that manufactures artists' watercolours. He employs two staff. Maisie is engaged full-time in production, whereas Maggie spends 75% of her time in production and the remaining 25% in production planning and general maintenance activities. Cornelius draws up a manufacturing account monthly. For the month of April 20X1 he has the following relevant balances:

	£
Maisie's wages	1 370
Maggie's wages	1 448
Opening stock of raw materials	86
Closing stock of raw materials	77
Purchase of pigments and binders	1 883
Purchase of tins and plastic paint containers	800
Depreciation of paint mixing vats	70
Depreciation of factory building	100
Depreciation of other factory equipment	87
Electricity and gas supply to factory	177
Water rates – factory	97
Cleaning wages	130
Factory insurance	71
Sundry factory expenses	51
Opening work-in-progress	93
Closing work-in-progress	64

Prepare Cornelius's manufacturing account for April 20X1.

7 Tia runs a manufacturing business as a sole trader. Her factory makes a range of plastic and metal wheelbarrows. At the end of her accounting year ending 31 August 20X8 she has the following totals in her books:

	£
Sales	465 656
Stock of finished goods at 31 August 20X8	30 006
Direct labour costs	89 200
Office rental	5 385
Factory supervision expenses	18 780
Import duties on raw materials purchases	2 868
Work-in-progress at 31 August 20X8	1 220
Interest received	1 200
Factory light and heat	5 598
Insurance	4 515
Stock of raw materials at 1 September 20X7	18 223
Sales returns	2 477
Sales staff salaries	35 500
Sundry administration costs	2 240
Depreciation of factory machinery	15 800
Raw materials purchases returns	1 820
Factory rental	25 660
Delivery costs (for deliveries to customers)	6 842
Stock of finished goods at 1 September 20X7	28 488
Other factory expenses	9 272
Business rates (factory)	9 823
Stock of raw materials at 31 August 20X8	15 269
Work-in-progress at 1 September 20X7	867
Discounts received	276
Administration office electricity	680

	£
Administration office telephone	2 662
Depreciation of office fixtures and computers	3 210
Administration staff salaries	18 289
Purchases of raw materials	138 850
Depreciation of delivery van	1800
Sundry distribution and selling costs	860

Note:

1. Of the insurance charge of £4515, 75% relates to the factory and 25% to administration.

Prepare a manufacturing account and a profit and loss account for Tia for the year ending 31 August 20X8. In the profit and loss account categorise the expenses under the headings 'Selling and distribution' and 'Administration'.

8 Dilip has run a successful umbrella manufacturing business for several years. His gross profit margin has remained constant at around 34%, and his net profit margin is usually between 14% and 15%. However, Dilip is concerned because he thinks that his business has underperformed in the current year. He presents you with the following list of balances for the year ending 30 September 20X8 and asks you to: (a) prepare a manufacturing account and a profit and loss account; and (b) calculate gross and net profit margins for the year. (Note that the profit and loss account is to show expenses under two main headings: selling and distribution; and administration.)

	£
Depreciation of factory machinery	6 696
Sundry administration costs	3 289
Raw materials purchases	112 787
Production supervisory salaries	24 690
Telephone charges – sales department	3 608
Administration office rental	13 374
Office insurance	2 401
Factory cleaning	8 792
Depreciation of office fixtures and fittings	1 895
Salespersons' salaries	28 660
Salespersons' commissions	2 811
Sales	449 760
Sales returns	1 560
Depreciation of delivery van	2 180
Electricity charges – administration office	2 780
Factory insurance	4 393
Depreciation of fittings in factory	2 200
Telephone charges – administration	1 603
Accountancy and tax advice	2 500
Sundry distribution and selling costs	906
Secretarial and administrative salaries	23 749
Depreciation of office computer	2 060
Wages of factory machine operators	99 270

	£
Light and heat for factory	9 222
Factory rental	28 700
Sundry factory expenses	1 861
Factory canteen costs	2 189
Factory repairs and maintenance	3 730
Opening stock at 1 October 20X7	
Raw materials	12 705
Work-in-progress	3 879
Finished goods	37 222
Closing stock at 30 September 20X8	
Raw materials	13 573
Work-in-progress	2 693
Finished goods	39 470

9 Ermintrude makes components for the motor industry, buying in plastic and metal raw materials from the UK and overseas. Her factory contains mostly quite old machinery, some of which is fully depreciated. She incurs relatively high labour and maintenance and repair costs. Ermintrude would like to borrow more money from the bank to invest in new plant and machinery so as to bring the production processes up to date and reduce labour costs. The bank manager has told her, however, that she must take steps to reduce her overdraft before he will consider lending any more money.

The following is Ermintrude's list of balances at 31 December 20X8 together with some notes that will help in preparing the accounts. You are required to:

a) Prepare a manufacturing account for Ermintrude for the year ending 31 December 20X8.

b) Prepare a profit and loss account for the year ending 31 December 20X8 and a balance sheet at that date.

c) Advise Ermintrude on how she can help to reduce her overdraft and borrow more money for investment in new plant and machinery.

	£
Sales	337 570
Capital at 1 January 20X8	114 560
Fixed assets at cost:	
Land	13 850
Buildings	50 000
Plant and machinery	93 450
Motor vehicles	39 822
Office equipment	13 000
Accumulated depreciation at 1 January 20X8:	
Buildings	9 000
Plant and machinery	87 482
Motor vehicles	17 422
Office equipment	2 600
Opening stock:	
Raw materials	15 250

	£
Work-in-progress	6 440
Finished goods	39 451
Purchases of raw materials	97 010
Import duties on purchases of raw materials	1 570
Direct labour costs	79 690
Factory supervisor's salary	14 771
Factory electricity	7 898
Factory insurance	5 790
Sundry factory expenses	1 770
Machinery repairs and maintenance	8 599
Factory cleaning	5 777
Closing stock:	
Raw materials	16 333
Work-in-progress	6 693
Finished goods	39 750
Debtors	46 242
Bank overdraft	28 411
Creditors	24 459
Bank loans (long term)	10 000
Drawings	39 511
Secretarial and clerical staff	12 760
Business rates	6 769
Electricity and gas	2 819
Office telephone	4 644
Delivery van expenses	3 890
Sales staff costs	17 231
Sundry administration and selling expenses	1 670
Interest paid	1 830

Note the following:

1. The depreciation charge for 20X8 in respect of plant and machinery has been calculated at £3130.
2. Depreciation is charged on the cost of buildings at 2% per annum on the straight line basis. The charge is split between the factory (80%) and the administration office (20%).
3. Depreciation is charged on the motor vehicles at the rate of 25% per annum on the reducing balance basis.
4. Depreciation is charged on the cost of the office equipment at 10% on the straight line basis.
5. A bill for office electricity for the period ending 31 December 20X8 was received after the year-end. The amount of the bill is £917 and it has not been recorded in the balances above.
6. Ermintrude's accountant advises her to include an accrual for his fees of £1300.

10 Ulrike owns a small manufacturing business which makes protective clothing for people working on oil rigs. She runs the business from a small factory unit which has a separate office. Quite a lot of the production work is carried out off the premises by subcontractors who undertake the work (mostly cutting out and sewing) at home using their own machinery. Ulrike's business, therefore, owns relatively little machinery.

Ulrike's net profit margin is usually about 16% and her gross profit margin is usually in the range 32 – 33%. She feels, however, that the business has not done quite so well in her most recent accounting year to 31 December 20X2 and she is worried about the fact that her business overdraft is now in excess of £6000. She would like to expand the business by investing in new machinery to produce hard hats for which there is high demand. She would need a loan of about £15 000 to buy the machinery.

Ulrike would like you to prepare a manufacturing account and a profit and loss account for the year ending 31 December 20X2, and a balance sheet at that date. Also, she would like a brief report on the performance of the business, including your views on whether or not the bank manager is likely to make a long-term loan of around £15 000 to the business.

Ulrike's records show the following totals at 31 December 20X2:

	£
Sales	136 800
Part-time administrator's salary	8 288
Office fittings and computer at cost	4 080
Rent and rates for factory unit	16 602
Accountancy and tax advice	700
Stock of raw materials at 1 January 20X2	6 862
Work-in-progress at 1 January 20X2	3 370
Stock of finished goods at 1 January 20X2	12 269
Factory repairs and maintenance	472
Office heat and light	982
Trade creditors	9 980
Machinery at cost	7 290
Office telephone	1 362
Raw materials purchases returns	815
Factory cleaning and security	803
Selling and distribution costs	3 996
Depreciation of machinery at 1 January 20X2	3 645
Depreciation of office fittings and computer at 1 January 20X2	2 448
Creditor for VAT	1 026
Purchases of raw materials	35 279
Insurance	1 200
Factory heat and light	3 966
Office rental	2 800
Interest paid	407
Stock of raw materials at 31 December 20X2	5 988
Work-in-progress at 31 December 20X2	3 961
Stock of finished goods at 31 December 20X2	13 604
Other factory costs	6 828

	£
Sundry office expenses	2 866
Capital at 1 January 20X2	28 593
Drawings	17 250
Debtors	19 489
Bank overdraft	6 260
Direct labour	32 406

Notes:

1. An adjustment is required in respect of depreciation of machinery. The machinery is depreciated at 10% on the straight line basis. None of the machinery is fully depreciated and there have been no additions or disposals during the year.
2. An adjustment is required in respect of depreciation of office fittings and computer. The office fittings and computer are depreciated at 10% on the straight line basis. None of the fittings or the computer is fully depreciated, and there have been no additions or disposals during the year.
3. The insurance cost covers both the factory and the office. 80% is attributable to the factory and 20% to the office.
4. An accrual of £472 must be made in respect of the most recent office telephone bill.

Exercises: answers available to lecturers

11 Alice runs a sweetie factory, manufacturing a wide range of sweets that are sold to retailers ready packaged in plastic bags. The following list includes some of the costs that she incurs:

- factory electricity and gas bills
- purchase of sugar
- salary of production supervisor
- oil for use on machines
- secretary's salary
- purchase of plastic bags for packing sweets
- factory cleaner's wages
- machine operators' wages
- salespersons' commission
- maintenance of factory security system
- purchase of paper for use in office computer
- factory insurance

- office insurance
- salespersons' mobile phone bills
- delivery van depreciation
- depreciation of machine used in toffee production
- factory canteen costs.

Place each of the above items in one of the following categories:

- direct materials
- direct labour
- production overheads
- administration and selling expenses.

12 Roisin's factory produces knitwear. Her costs include the following:

- repair to office computer
- purchases of wool and acrylic for garments
- fees for legal advice in respect of dispute over parking outside the business premises
- payments to knitting machine operators
- interest on bank overdraft
- sales staff commissions
- subscription to Knitwear Manufacturers' Association
- purchases of labels for garments
- oil for lubricating knitting machines
- wages of factory cleaning staff.

Place each of the items above in one of the following categories:

- direct materials
- direct labour
- production overheads
- administration and selling expenses.

13 Brett's factory manufactures parts for bicycles. The balances in his books at 31 December 20X6 include the following items of cost:

	£
Depreciation of factory	1 200
Production supervisor's salary	11 690

	£
Factory cleaning	8 818
Depreciation of office equipment	2 120
Administrative staff salaries	12 420
Purchase of rubber for inner tubes	18 280
Purchase of metal for spoke manufacture	12 992
Purchase of oil for oiling plant and machinery	986
Electricity supply to factory	6 469
Business insurance*	3 948
Depreciation of plant and machinery	5 888
Payment of wages to machine operators	26 969
Maintenance and repair of machinery	3 438
Opening stock of raw materials	3 307
Closing stock of raw materials	2 983

* The business insurance charge of £3948 covers both the factory and the administration office. Two-thirds of the charge relates to the factory.

1. What is the total prime cost for inclusion in Brett's manufacturing account for the year ending 31 December 20X6?

   a) £58 241

   b) £70 255

   c) £58 565

   d) £59 551.

2. What is the total for indirect production overheads for inclusion in Brett's manufacturing account for the year ending 31 December 20X6?

   a) £41 121

   b) £29 431

   c) £55 661

   d) £68 090.

14 Curtis has a chewing gum factory. A manufacturing account is required for the year ending 31 December 20X4. Curtis has listed the following relevant balances from the accounting records of the business:

	£
Factory wages*	118 377
Purchase of gum	171 430
Purchase of flavourings	6 433
Purchase of chewing gum wrappers	8 989
Opening stock of gum	15 444
Opening stock of flavourings	737
Opening stock of chewing gum wrappers	981
Closing stock of gum	14 983

	£
Closing stock of flavourings	1 317
Closing stock of chewing gum wrappers	890
Depreciation of machinery	9 818
Sundry maintenance materials	652
Factory cleaning	2 988
Factory canteen costs	9 883
Factory rental	29 380
Factory insurance	8 800
Opening work-in-progress	286
Closing work-in-progress	173

*Note: Machine operatives do not spend all their time directly engaged in production; they are also responsible for carrying out basic maintenance operations and cleaning. The total for factory wages of £118 377 includes £17 465 for the factory supervisor's salary. Of the remainder 80% is classed as direct wages, and the remaining 20% as indirect production overheads.

Prepare Curtis's manufacturing account for the year ending 31 December 20X4.

15 Shelby's factory manufactures files and folders for supply to stationery retailers. Included in Shelby's accounting records are the following totals relating to the year ending 31 March 20X4:

	£
Heat and light for factory	7 650
Factory telephone charges	1 086
Raw materials purchases returns	883
Stock of raw materials at 1 April 20X3	10 260
Work-in-progress at 1 April 20X3	2 306
Purchases of raw materials	128 466
Machinery at cost	182 570
Depreciation of machinery at 1 April 20X3	86 867
Factory manager's salary	23 236
Factory rental	28 870
Stock of raw materials at 31 March 20X4	12 900
Work-in-progress at 31 March 20X4	2 512
Fork lift truck operators' wages	17 720
Production supervisors' salary	36 860
Factory health and safety expenses	3 266
Direct labour	98 750
Factory cleaning	5 580
Business rates on factory premises	10 444
Other factory expenses	8 825

Notes:

1. Machinery is depreciated on the reducing balance basis at 10%. There

have been no acquisitions or disposals of machinery during the year ending 31 March 20X4.

2. Of the factory rent of £28 870, £2790 relates to the next accounting period, and should be treated as a prepayment.
3. An invoice for £639 has just been received for electricity supplied to the factory during March 20X4. An accrual should be made for this invoice.

Prepare Shelby's manufacturing account for the year ending 31 March 20X4.

16 Debra is in business producing household linen. She buys in plain fabrics, dyes them and makes them up into table and bed linen. Her small factory employs six people, five of whom are directly involved in dyeing and stitching. The sixth splits her time evenly between administration and production supervision. Her wages of £9210 are split 50:50 between administration expense and production supervision expense. Last year Debra's business made a net profit margin of 14.6% on turnover of £217 414. For this year, the year to 31 March 20X5, Debra knows that she has made slightly more in sales, but suspects that her net profit margin percentage has fallen. From the list of relevant balances given below, prepare a manufacturing account and a profit and loss account for Debra's business for the year ending 31 March 20X5. Calculate the net profit margin percentage, and the percentage change in net profit from 20X4 to 20X5.

	£
Administration/production supervision wages	9 210
Purchases of fabrics	65 069
Purchases of dyes, ribbons and other trimmings	7 821
Purchases of packaging materials	6 988
Factory rental	13 750
Factory cleaning	3 700
Secretarial salary	7 935
Sundry factory expenses	2 475
Sales	218 930
Rental of office and other premises costs	6 339
Electricity – offices	990
Factory heat and light	4 655
Factory wages – direct labour	42 373
Factory security services	1 250
Office telephone charges	1 576
Travelling expenses	1 653
Distribution expenses	4 772
Stationery and office supplies	871
Accountancy, tax and legal advice	1 350
Sundry office expenses	378
Opening stock at 1 April 20X4	
Raw materials: fabrics	5 900
Raw materials: dyes, ribbons, etc.	1 360

	£
Raw materials: packaging	936
Finished goods stock	16 330
Closing stock at 31 March 20X5	
Raw materials: fabrics	8 208
Raw materials: dyes, ribbons, etc.	1 241
Raw materials: packaging	1 407
Finished goods stock	15 212

The following should be noted:

1. Debra makes sure that there is no work-in-progress stock in the factory at the accounting year-end.
2. The business has machinery at cost of £44 200. A depreciation charge of 10% on cost is to be included in the accounts for the year ending 31 March 20X5.
3. The business owns factory fixtures that cost £11 500. A depreciation charge of 10% on cost is to be included in the accounts for the year ending 31 March 20X5.
4. The business owns a van that is depreciated on the reducing balance basis at the rate of 25% per annum. The net book value of the van at 1 April 20X4 was £9788, and an adjustment for van depreciation will be required in the accounts for the year ending 31 March 20X5.
5. An electricity bill for office electricity consumption for the three months to 31 March 20X5 must be accrued. The bill is for £330.

17. Ting is a sole trader who manufactures plastic bottles. A couple of years ago she invested in an automatic production line, spending £125 000 on new equipment. This investment has allowed her to cut direct labour costs by a substantial amount. The equipment is assumed to have a residual value of £10 000, and is depreciated on the straight line basis over a ten year period.

Ting inherited the factory premises from her uncle. The factory is recorded at £210 000 in Ting's accounts; this valuation was obtained from a professional valuer at the time of her uncle's death. Since acquiring the factory, Ting has depreciated it at 1% per year on the straight line basis. Office premises are situated next door to the factory – Ting pays rent for the office.

Other fixed assets comprise office equipment which cost £28 200. This is depreciated on the straight line basis at 10% per year. None of the office equipment is fully depreciated.

Ting's income and expense totals for her financial year ending 31 December 20X3 are as follows:

	£
Sales returns	268
Discounts received	868
Stock of raw materials at 1 January 20X3	9 875
Stock of finished goods at 1 January 20X3	16 276

	£
Office telephone charges	5 613
Indirect factory labour costs	27 779
Purchases of raw materials	109 250
Sales	303 675
Office rental	2 800
Office heat and light	2 620
Factory repairs	3 727
Heat and light for factory	11 279
Stock of raw materials at 31 December 20X3	10 211
Stock of finished goods at 31 December 20X3	15 998
Business rates for factory	7 000
Production manager's salary	25 966
Other factory expenses	5 800
Direct labour	20 426
Selling and distribution costs	20 772
Secretarial salary	12 220
Interest paid	5 570
Other administrative expenses	4 475

Notes:

1. There was no opening or closing work-in-progress.
2. A telephone bill of £1250 should be accrued for.
3. Of the total of £7000 for business rates, £1430 relates to the next accounting period and should be treated as a prepayment.

Prepare a manufacturing account and a profit and loss account for Ting for the year ending 31 December 20X3, including all necessary adjustments for depreciation.

18. Ulysses Unsworth runs a factory manufacturing baby food, which is sold in jars and tins to retailers. New European legislation has recently been introduced and is due to come into force early in 20X6. As a result of the tighter standards applicable to baby food manufacture, Ulysses expects to have to replace some of his factory machinery, and to introduce a new hygiene audit system. He expects that the additional costs of complying with the new regime will amount to around £25 000 per year.

Ulysses' records show the following information at his year end of 31 December 20X5:

	£
Raw materials purchases	97 472
Sales staff salary	25 250
Interest paid	4 000
Freehold property at cost	200 000
Factory manager's salary	29 900
Office telephone	2 217

	£
Office equipment at cost	18 500
Direct labour	65 279
Factory supervisory salaries	26 250
Depreciation of car at 1 January 20X5	9 562
Business rates	9 500
Depreciation of freehold property at 1 January 20X5	16 000
Factory machinery at cost	75 650
Repairs to factory	3 688
Factory cleaning and security	4 006
Business insurance	6 300
Sales	387 553
Finished goods stock at 1 January 20X5	9 390
Depreciation of factory machinery at 1 January 20X5	58 050
Administrative salaries	19 755
Factory heat and light	6 321
Sales returns	10 611
Car at cost	18 750
Trade creditors	42 441
Stock of raw materials at 31 December 20X5	722
Repairs to machinery	2 850
Office electricity	998
Sundry factory expenses	3 601
Bank overdraft	5 882
Capital at 1 January 20X5	136 387
Stock of raw materials at 1 January 20X5	876
Factory canteen costs	7 806
Drawings	35 000
Debtors	50 966
Stock of finished goods at 31 December 20X5	10 227
Sundry administration expenses	2 639
Accountancy and tax	2 000
Long-term loan	80 000
Depreciation of office equipment at 1 January 20X5	3 700

Notes:

No adjustments have been made for the 20X5 depreciation. There were no acquisitions or disposals of fixed assets during the 20X5 year.

1. The freehold property is depreciated at 1% of cost per year. Of the total cost of £200 000, £180 000 relates to the factory and £20 000 to the administrative offices.
2. The factory machinery is depreciated at 10% on the straight line basis per year. However, of the total cost of £75 650, £45 000 is already fully depreciated.
3. The office equipment, which was all acquired in the last three years, is depreciated at 10% per year on the straight line basis.
4. The car is depreciated at 30% on the reducing balance basis.

5. Of the business rates bill of £9500, 75% relates to the factory and 25% to the administration office.
6. Of the insurance of £6300, 85% relates to the factory and 15% to the administration office.
7. Sundry factory expenses include a fine of £2000 for breaches of environmental health legislation.
8. There is no work-in-progress at either 1 January 20X5 or 31 December 20X5.

a) Prepare a manufacturing account and profit and loss account for Ulysses for the year ending 31 December 20X5, and a balance sheet at that date.
b) Advise Ulysses on the potential impact of the new European legislation on his business, taking into account his 20X5 results and his existing assets and liabilities.

! CASE STUDY Using accounts to give advice

Atul left university with a first class degree in chemistry. He had been particularly interested in plastics, and continued to study in his spare time after he started his career as an industrial chemist. He discovered a new way of laminating cloth, which produced a very durable, heat-resistant and fireproof result. He registered the patent for his method and decided to leave work and set up a manufacturing business to exploit the technology he had discovered. Atul's father, a businessman himself, advanced an interest-free loan of £15 000 to help get the business started. Atul was able to set up in a small unit on an industrial estate with the help of a low rental deal provided by the local authority.

Five years after setting up, Atul is still in business, trading as Belle Vue Laminates. He employs seven people full-time in the factory – six machine operatives and a production progress chaser. In the office there are a secretary, an invoicing clerk and a part-time bookkeeper. He has built up the sales order book himself and prospects are looking reasonably bright. However, Atul recently attended a seminar for young business people entitled 'Expanding your business'. He has felt for several months now that his business is in danger of stagnating and that he needs to increase the volume of sales. So far, Atul has done virtually all of the sales development work himself, although his father has helped by introducing him to some of his business contacts. He enjoys selling, and feels that he could increase sales volumes substantially if he spent more time out of the office. A recent article in the business press on export opportunities in Europe has encouraged him to think about potential markets overseas.

Atul has arranged a meeting with a small business development adviser to discuss an idea he has had to facilitate expansion of the business. He would like to explore the idea of employing a graduate in business studies with the intention of delegating quite a lot of the responsibility for day-to-day running of the factory and administration to the new employee. Atul estimates that he currently spends about three days per week running the factory and dealing with administrative queries, but problems keep building up and there have been some customer complaints about quality in recent months. (The rest of his working week is spent on the road visiting customers and seeking out new selling opportunities.) Atul's plan is that the new employee should spend, on average, three days per week supervising all aspects of production (including the implementation of proper quality control systems) and a further two days in improving the business administration. Atul realises that he will have to be prepared to pay a reasonably good salary to be able to employ a person with sufficient initiative to run the factory effectively in his absence, and he is prepared to pay up to £25 000 per year for the right person. However, he feels confident that he can increase sales substantially if his time is freed up to explore new selling opportunities.

Atul currently still has the £15 000 loan from his father, and has negotiated a flexible overdraft facility of up to £10 000 with the bank manager.

Atul's accountant, Shona, prepares his accounts annually up to his year-end of 30 September. It is now 15 October and Atul is due to meet the business adviser on 31 October. He asks Shona to quickly prepare a draft manufacturing account, profit and loss account and balance sheet from the list of balances and notes on adjustments given below.

Requirements are:

1. To prepare the profit and loss account for the year ending 30 September 20X2 and the balance sheet at that date for Belle Vue Laminates.
2. To advise Atul on the possible effects on his business of employing a graduate on £25 000 per year, examining both financial and non-financial potential impacts.

	£
Office salaries	21 560
Import duties on raw material purchases	3 370
Raw materials purchases	72 444
Accountancy and tax advice	1 150
Plant and machinery at cost	109 300
Accumulated depreciation on plant and machinery at 1 October 20X1	14 620
Debtors	29 930
Bank overdraft	2 495
Production progress chaser's wages	12 071
Factory electricity	7 474
Office electricity	950
Office insurance	1 879
Loan from Atul's father	15 000
Factory insurance	6 467
Distribution costs	9 308
Interest paid	951
Fixtures and fittings at cost	10 750
Accumulated depreciation on fixtures and fittings at 1 October 20X1	3 012
Maintenance of plant and machinery	3 060
Factory rental	20 792
Office telephone	2 145
Entertaining expenses	1 280
Creditors	12 790
Capital at 1 October 20X1	116 409
Office sundry expenses	963
Office rental	2 944
Bad debts written off	1 200
Travelling expenses	8 963
Factory wages	70 493
Factory sundry expenses	1 409
Sales	302 240
Sales returns	3 780
Charitable donations	300
Drawings	28 000
Opening stock at 1 October 20X1:	
Raw materials	6 888
Work-in-progress	3 131
Finished goods	23 614

	£
Closing stock at 30 September 20X2:	
Raw materials	12 941
Work-in-progress	2 968
Finished goods	29 497

Note the following:

1. £584 of the office insurance balance of £1879 relates to the period after 30 September 20X2.
2. The last quarter's telephone bill of £703 was received on 8 October 20X2 and is not included in the figures above.
3. Atul has just discovered that a customer has gone into liquidation. The customer owes Belle Vue £400, but there is very little likelihood of ever receiving the money. Therefore, Atul decides to write off the bad debt.
4. Adjustments for depreciation have not yet been made. Plant and machinery is depreciated at 10% of cost. None of the plant and machinery is fully depreciated. Sundry fixtures and fittings are depreciated at 20% on the reducing balance basis.

Step 1: Allocate balances

The first step is to allocate balances to the manufacturing account, the trading account, the profit and loss account or to the balance sheet.

	£	Category
Office salaries	21 560	Profit and loss account
Import duties on raw material purchases	3 370	Manufacturing account – direct materials
Raw materials purchases	72 444	Manufacturing account – direct materials
Accountancy and tax advice	1 150	Profit and loss account
Plant and machinery at cost	109 300	Balance sheet
Accumulated depreciation on plant and machinery at 1 October 20X1	14 620	Balance sheet
Debtors	29 930	Balance sheet
Bank overdraft	2 495	Balance sheet
Production progress chaser's wages	12 071	Manufacturing account – indirect production overheads
Factory electricity	7 474	Manufacturing account – indirect production overheads
Office electricity	950	Profit and loss account
Office insurance	1 879	Profit and loss account
Loan from Atul's father	15 000	Balance sheet
Factory insurance	6 467	Manufacturing account – indirect production overheads
Distribution costs	9 308	Profit and loss account
Interest paid	951	Profit and loss account

	£	Category
Fixtures and fittings at cost	10 750	Balance sheet
Accumulated depreciation on fixtures and fittings at 1 October 20X1	3 012	Balance sheet
Maintenance of plant and machinery	3 060	Manufacturing account – indirect production overheads
Factory rental	20 792	Manufacturing account – indirect production overheads
Office telephone	2 145	Profit and loss account
Entertaining expenses	1 280	Profit and loss account
Creditors	12 790	Balance sheet
Capital at 1 October 20X1	116 409	Balance sheet
Office sundry expenses	963	Profit and loss account
Office rental	2 944	Profit and loss account
Bad debts written off	1 200	Profit and loss account
Travelling expenses	8 963	Profit and loss account
Factory wages	70 493	Manufacturing account – direct labour
Factory sundry expenses	1 409	Manufacturing account – indirect production overheads
Sales	302 240	Trading account
Sales returns	3 780	Trading account
Charitable donations	300	Profit and loss account
Drawings	28 000	Balance sheet
Opening stock at 1 October 20X1:		
Raw materials	6 888	Manufacturing account – direct materials and balance sheet
Work-in-progress	3 131	Manufacturing account – adjustment and balance sheet
Finished goods	23 614	Trading account and balance sheet
Closing stock at 30 September 20X2:		
Raw materials	12 941	Manufacturing account – direct materials and balance sheet
Work-in-progress	2 968	Manufacturing account – adjustment and balance sheet
Finished goods	29 497	Trading account and balance sheet

Step 2: Deal with adjustments

1. A prepayment of £584 will be recorded in the balance sheet in respect of the office insurance paid in advance. The office insurance in the profit and loss account will be £1879 − £584 = £1295.

2. An accrual of £703 will be recorded in the balance sheet in respect of the telephone bill received after the year-end. In the profit and loss account office telephone charges will be £2145 + £703 = £2848.
3. There is already a balance of £1200 in respect of bad debts written off. This will increase by £400 to £1600 to reflect the additional write-off. Debtors in the balance sheet will reduce by the same amount and will be stated at £29 930 − £400 = £29 530.
4. Plant and machinery depreciation for the year will be £109 300 × 10% = £10 930. This becomes an expense in the manufacturing account, where it is included under indirect production overheads, and accumulated depreciation in the balance sheet increases to £14 620 + £10 930 = £25 550. Depreciation on fixtures and fittings is charged at 20% on the reducing balance basis. The net book value brought forward is £10 750 + £3012 = £7738. The depreciation charge for the year is 20% of that net book value: £7738 × 20% = £1548 to the nearest £. There will be a charge of £1548 to the profit and loss account, and accumulated depreciation in the balance sheet increases to £3012 + £1548 = £4560.

Step 3: Produce manufacturing account

	£	£	£
Direct costs			
Direct materials			
Opening stock	6 888		
Add: purchases	72 444		
+ import duty on purchases	3 370		
	82 702		
Less: closing stock	(12 941)		
		69 761	
Direct labour		70 493	
Total direct costs (prime cost)			140 254
Production overheads (indirect costs)			
Factory rental		20 792	
Depreciation of factory plant and machinery		10 930	
Maintenance of plant and machinery		3 060	
Production progress chaser's wages		12 071	
Factory electricity		7 474	
Factory insurance		6 467	
Factory sundry expenses		1 409	
Total production overheads			62 203
Add: opening work-in-progress			3 131
Less: closing work-in-progress			(2 968)
Factory cost of finished goods			202 620

Step 4: Produce profit and loss account

Belle Vue Laminates: Profit and loss account for the year ending 30 September 20X2

	£	£
Sales		302 240
Less: returns		(3 780)
		298 460
Less: cost of sales		
Opening stock of finished goods	23 614	
Add: factory cost of finished goods [from manufacturing account]	202 620	
	226 234	
Less: closing stock of finished goods	(29 497)	
Cost of sales		(196 737)
Gross profit		101 723
Expenses		
Office salaries	21 560	
Office rental	2 944	
Office electricity	950	
Office insurance	1 295	
Office telephone	2 848	
Distribution costs	9 308	
Travelling expenses	8 963	
Entertaining expenses	1 280	
Depreciation of fixtures and fittings	1 548	
Interest paid	951	
Bad debts written off	1 600	
Accountancy and tax advice	1 150	
Charitable donations	300	
Office sundry expenses	963	(55 660)
Net profit		46 063

Step 5: Produce balance sheet

Belle Vue Laminates: Balance sheet at 30 September 20X2

	£	£
Fixed assets		
Plant and machinery at cost	109 300	
Less: accumulated depreciation (£14 620 + £10 930)	(25 550)	
		83 750
Fixtures and fittings at cost	10 750	
Less: accumulated depreciation (£3012 + £1548)	(4 560)	
		6 190
		89 940

	£	£
Current assets		
Stocks:		
Raw materials	12 941	
Work-in-progress	2 968	
Finished goods	29 497	
Debtors	29 530	
Prepayment	584	
	75 520	
Current liabilities		
Bank overdraft	(2 495)	
Creditors	(12 790)	
Accrual	(703)	
	(15 988)	
Net current assets		59 532
		149 472
Long-term liability: loan		(15 000)
		134 472
Capital		
Capital at 1 October 20X1		116 409
Add: profit for the year		46 063
Less: drawings		(28 000)
		134 472

Advice to Atul

Atul's proposal to employ a graduate at a salary of £25 000 involves some risks. There will be an additional charge on the business profits, which for this year are just over £46 000. The risk is that employing another person will not yield any benefits to the business, but will substantially increase its costs and reduce its profits. There is the additional major risk of employing the wrong person. It seems that Atul wants to use the opportunity to travel widely in order to increase sales, especially export sales. In doing so, he would not be able to supervise the work of the new employee closely. He takes the risk of incurring substantial damage to the business if he does not make the right appointment.

However, there are indications from the accounting figures drafted above that the business may lack sufficient effective supervision. There have been problems with quality, perhaps evidenced by the sales returns figure. Also, stock has built up substantially during the year: total stock at the beginning of the year was £6888 + £3131 + £23 614 = £33 633 and by the end of the year it had reached £12 941 + £2968 + 29 497 = £45 406. The percentage increase in total stocks over the year is 35%). The build-up of stock may be planned, but it may, on the other hand, indicate insufficient control over the business. The business has run into overdraft, and may need tighter controls over spending and collecting cash from debtors. A new employee in a supervisory role could make significant improvements in the control of the business.

If the new employee proved to be effective, and Atul was able to expand the order book, the business could potentially grow and become more profitable. However, Atul needs to be fully aware of the risks he takes in delegating so much responsibility to an employee who is likely to be relatively inexperienced. It might be possible to reduce the risk by easing the new employee gradually into his or her role. Atul could plan to spend more time on the premises at first, before gradually increasing the time he spends away from the factory in expanding sales.

All growing businesses reach a point where their proprietors have to seriously consider recruiting at a managerial level. The decision about how best to do this is never easy. Employing the wrong person at this stage could be disastrous. Atul might consider using the services of a professional agency to help in the recruitment process. This would not guarantee a successful appointment, but would probably make success more likely.

Answers to self-test questions and exercises

Answers to self-test questions

1 Billy's costs are categorised as follows:

- Purchase of wood for making toys = Materials cost.
- Depreciation of factory machinery = Production overheads.
- Employee costs – machine operators = Labour cost.
- Production supervisor's salary = Production overheads.
- Electricity bill for factory = Production overheads.
- Electricity bill for office = Administration and selling expenses.
- Depreciation of office equipment = Administration and selling expenses.
- Telephone bill = Administration and selling expenses.
- Delivery van expenses = Administration and selling expenses.
- Secretary's salary = Administration and selling expenses.
- Purchase of plastics for making toys = Materials cost.
- Purchase of paper for office computer = Administration and selling expenses.
- Purchase of toy packaging = Materials cost.

2 *Step 1: Identify those items relating to the manufacturing account*

	£	Category
Depreciation of factory machinery	10 493	Manufacturing account – indirect production overheads
Accountancy and tax advice	1 200	Profit and loss account
Purchases of raw materials	78 439	Manufacturing account – direct materials
Office insurance	3 442	Profit and loss account
Salespersons' salaries	24 410	Profit and loss account
Factory rental	23 700	Manufacturing account – indirect production overheads
Sales	341 115	Trading account
Electricity and gas for factory	9 942	Manufacturing account – indirect production overheads
Office rental	6 344	Profit and loss account
Sundry selling expenses	827	Profit and loss account
Telephone – salespersons	2 492	Profit and loss account
Secretarial costs	9 314	Profit and loss account
Electricity – office	1 824	Profit and loss account
Factory insurance	3 773	Manufacturing account – indirect production overheads

Depreciation – factory computer	1 220	Manufacturing account – indirect production overheads
Repairs and maintenance to factory machinery	3 111	Manufacturing account – indirect production overheads
Production supervisory salaries	25 471	Manufacturing account – indirect production overheads
Delivery charges	17 270	Profit and loss account
Telephone – administration	1 720	Profit and loss account
Office sundry expenses	714	Profit and loss account
Factory sundry expenses	234	Manufacturing account – indirect production overheads
Factory wages	81 479	Manufacturing account – direct labour

Step 2: Produce manufacturing account

Brightwell Components: Manufacturing account for the year ending 31 August 20X4

	£	£	£
Direct costs			
Direct materials			
Opening stock	13 210		
Add: purchases	78 439		
	91 649		
Less: closing stock	(12 994)		
		78 655	
Direct labour		81 479	
Total direct costs (prime cost)			160 134
Production overheads (indirect costs)			
Factory rental		23 700	
Depreciation of factory machinery		10 493	
Repairs and maintenance to factory machinery		3 111	
Production supervisory salaries		25 471	
Electricity and gas for factory		9 942	
Factory insurance		3 773	
Depreciation – factory computer		1 220	
Factory sundry expenses		234	
Total production overheads			77 944
Add: opening work-in-progress			2 511
Less: closing work-in-progress			(2 145)
Factory cost of finished goods			238 444

Step 3: Produce profit and loss account, including trading account

Brightwell Components: Profit and loss account for the year ending 31 August 20X4

	£	£	£
Sales			341 115
Less: cost of sales			
Opening stock of finished goods		26 700	
Add: factory cost of finished goods [from manufacturing account]		238 444	
		265 144	
Less: closing stock of finished goods		(29 363)	
Cost of sales			(235 781)
Gross profit			105 334
Expenses			
Selling and distribution expenses			
Salespersons' salaries	24 410		
Delivery charges	17 270		
Telephone – salespersons	2 492		
Sundry selling expenses	827		
		44 999	
Administration expenses			
Secretarial costs	9 314		
Electricity – office	1 824		
Telephone – administration	1 720		
Office rental	6 344		
Office insurance	3 442		
Office sundry expenses	714		
Accountancy and tax advice	1 200		
		24 558	
			(69 557)
Net profit			35 777

Answers to exercises

1 Amber's costs are categorised as follows:

- Purchase of felt for hat-making = Direct materials.
- Factory rental payments = Production overheads.
- Factory supervisor's wages = Production overheads.
- Clerk's wages = Administration and selling expenses.
- Depreciation of sewing machines used in hat-making = Production overheads.
- Telephone bill = Administration and selling expenses.
- Factory electricity bill = Production overheads.
- Employee costs – hat-makers = Direct labour.
- Purchase of feathers, beads and sequins for trimming hats = Direct materials.
- Depreciation of office computer = Administration and selling expenses.
- Factory insurance = Production overheads.
- Delivery costs = Administration and selling expenses.

2 Rufus' costs are categorised as follows:

Factory supervisor's wages	Production overheads
Accountancy and tax advisory fees	Administration and selling expenses
Purchase of cedarwood for pencils	Direct materials
Business rates on factory and offices	Production overheads *and* administration and selling expenses
Factory cleaning expenses	Production overheads
Insurance of factory and offices	Production overheads *and* administration and selling expenses
Factory heating costs	Production overheads
Payments to lathe and machine operators	Direct labour
Purchase of colour pigments	Direct materials
Sales administrator's salary	Administration and selling expenses

3 Prime cost is the total of direct costs. Bob's balances include two categories of direct costs: direct labour and direct materials. Total prime cost is worked out as follows:

	£	£
Direct materials		
Opening stock of raw materials	3 433	
Add: purchases of raw materials	26 540	
Less: closing stock of raw materials	(3 221)	
		26 752
Direct labour: machine operatives' wages		19 366
Prime cost		46 118

The correct answer, therefore, is d).

4 Carrie: Manufacturing account for May 20X6

	£	£	£
Direct costs			
Direct materials			
Opening stock	7 492		
Add: purchases	76 892		
	84 384		
Less: closing stock	(8 441)		
		75 943	
Direct labour		93 330	
Total direct costs (prime cost)			169 273
Production overheads (indirect costs)			
Production supervisor's salary		15 760	
Maintenance of factory machinery		2 994	
Factory cleaner's wages		7 400	
Depreciation of freehold factory building		5 600	
Factory insurance		4 654	
Electricity for factory		10 333	
Sundry factory costs		1 808	
Depreciation of machinery		6 667	
Total production overheads			55 216
Add: opening work-in-progress			1 101
Less: closing work-in-progress			(1 004)
Factory cost of finished goods			224 586

5 Stacey

Working 1: depreciation of factory building

£200 000 × 2% = £4000

Working 2: depreciation of machinery

Net book value at 1 May 20X6	105 750
Addition to machinery	7 250
	112 500

Depreciation for the year = £112 500 × 15% = £16 875

Manufacturing account for the year ending 30 April 20X6

	£	£	£
Direct materials			
Opening stock	25 850		
Add: purchases	200 883		

	£	£	£
Less: purchases returns	(1 727)		
	225 006		
Less: closing stock	(27 777)		
		197 229	
Direct labour		132 630	
Total direct costs (prime cost)			329 859
Production overheads			
Depreciation of factory building (working 1)		4 000	
Depreciation of machinery (working 2)		16 875	
Machinery repair		1 779	
Factory insurance (£7260 – 400)		6 860	
Business rates (£8000 × 90%)		7 200	
Supervisors' salaries		42 421	
Factory manager's salary		32 066	
Factory cleaning and security		6 860	
Other factory expenses		18 288	
Total production overheads			136 349
			466 208
Add: opening work-in-progress			2 828
Less: closing work-in-progress			(1 384)
Factory cost of finished goods			467 652

6 Cornelius: Manufacturing account for April 20X1

	£
Working – direct labour comprises:	
100% of Maisie's wages	1 370
75% of Maggie's wages: £1448 × 75%	1 086
Total	2 456

	£	£	£
Direct costs			
Direct materials			
Opening stock	86		
Add: purchases (£1883 + £800)	2 683		
	2 769		
Less: closing stock	(77)		
		2 692	
Direct labour (see working above)		2 456	
Total direct costs (prime cost)			5 148
Production overheads (indirect costs)			
Indirect wages (Maggie: 25% × £1448)		362	
Depreciation of paint mixing vats		70	
Depreciation of factory building		100	

	£	£	£
Depreciation of other factory equipment		87	
Electricity and gas supply to factory		177	
Water rates – factory		97	
Cleaning wages		130	
Factory insurance		71	
Sundry factory expenses		51	
Total production overheads			1 145
Add: opening work-in-progress			93
Less: closing work-in-progress			(64)
Factory cost of finished goods			6 322

7 Tia: Manufacturing account for the year ending 31 August 20X8

	£	£	£
Direct materials			
Opening stock of raw materials	18 223		
Add: purchases	138 850		
Add: import duties on purchases	2 868		
Less: purchases returns	(1 820)		
	158 121		
Less: closing stock of raw materials	(15 269)		
		142 852	
Direct labour		89 200	
Total direct costs (prime cost)			232 052
Production overheads			
Depreciation of factory machinery		15 800	
Factory rental		25 660	
Business rates		9 823	
Insurance (£4515 × 75%)		3 386	
Factory light and heat		5 598	
Factory supervision expenses		18 780	
Other factory expenses		9 272	
Total production overheads			88 319
			320 371
Add: opening work-in-progress			867
Less: closing work-in-progress			(1220)
Factory cost of finished goods			320 018

Tia: Profit and loss account for the year ending 31 August 20X8

	£	£	£
Sales			465 656
Less: sales returns			(2 477)
			463 179
Opening stock of finished goods		28 488	

	£	£	£
Add: factory cost of finished goods		320 018	
		348 506	
Less: closing stock of finished goods		(30 006)	
			318 500
Gross profit			144 679
Interest received			1 200
Discounts received			276
			146 155
Expenses			
Selling and distribution			
Sales staff salaries	35 500		
Delivery costs	6 842		
Depreciation of delivery van	1 800		
Sundry distribution and selling costs	860		
		45 002	
Administration			
Office rental	5 385		
Insurance (£4515 x 25%)	1 129		
Administration salaries	18 289		
Administration office electricity	680		
Administration office telephone	2 662		
Depreciation of office fixtures and computer	3 210		
Sundry administration expenses	2 240		
		33 595	
			78 597
Net profit			67 558

8 Dilip: Manufacturing account for the year ending 30 September 20X8

	£	£	£
Direct costs			
Direct materials			
Opening stock	12 705		
Add: purchases	112 787		
	125 492		
Less: closing stock	(13 573)		
		111 919	
Direct labour		99 270	
Total direct costs (prime cost)			211 189
Production overheads (indirect costs)			
Depreciation of factory machinery		6 696	
Production supervisory salaries		24 690	
Factory cleaning		8 792	
Factory insurance		4 393	
Depreciation of fittings in factory		2 200	

	£	£	£
Light and heat for factory		9 222	
Factory rental		28 700	
Sundry factory expenses		1 861	
Factory canteen costs		2 189	
Factory repairs and maintenance		3 730	
Total production overheads			92 473
Add: opening work-in-progress			3 879
Less: closing work-in-progress			(2 693)
Factory cost of finished goods			304 848

Dilip: Profit and loss account for the year ending 30 September 20X8

	£	£	£
Sales			449 760
Less: returns			(1 560)
			448 200
Less: cost of sales			
Opening stock of finished goods		37 222	
Add: factory cost of finished goods [from manufacturing account]		304 848	
		342 070	
Less: closing stock of finished goods		(39 470)	
Cost of sales			(302 600)
Gross profit			145 600
Expenses			
Selling and distribution			
Telephone charges – sales department	3 608		
Salespersons' salaries	28 660		
Salespersons' commissions	2 811		
Depreciation of delivery van	2 180		
Sundry distribution and selling costs	906	38 165	
Administration			
Administration office rental	13 374		
Electricity charges – administration office	2 780		
Telephone charges – administration	1 603		
Secretarial and administrative salaries	23 749		
Depreciation of office computer	2 060		
Depreciation of office fixtures and fittings	1 895		
Office insurance	2 401		
Accountancy and tax advice	2 500		
Sundry administration costs	3 289		
		53 651	
			(91 816)
Net profit			53 784

Margins

Gross profit margin for the year:

$$= \frac{145\,600}{448\,200} \times 100 = 32.5\%$$

Net profit margin for the year:

$$= \frac{53\,785}{448\,200} \times 100 = 12\%$$

9 Workings

1. Depreciation on buildings at 2% on cost: £50 000 × 2% = £1000. 80% of this charge (i.e. £800) will be included in indirect production overheads and the remaining 20% (i.e. £200) will be charged to profit and loss account.
2. Depreciation on motor vehicles: net book value at 1 January 20X8 is cost less accumulated depreciation to that date: £39 822 − 17 422 = £22 400. Depreciation is, therefore, 25% × 22 400 = £5 600.
3. Depreciation on office equipment is 10% × cost of £13 000 = £1300.
4. The office electricity and gas charge recorded in the list of balances is £2819. This will be increased by the accrual of £917 to £3736.
5. An accrued expense of £1300 for accountant's fees will be included in profit and loss account.
6. The total for accruals in the balance sheet will be £917 + £1300 = £2217.

a) Manufacturing account

Ermintrude: Manufacturing account for the year ending 31 December 20X8

	£	£	£
Direct costs			
Direct materials			
Opening stock	15 250		
Add: purchases	97 010		
Add: import duty on purchases	1 570		
	113 830		
Less: closing stock	(16 333)		
		97 497	
Direct labour		79 690	
Total direct costs (prime cost)			177 187
Production overheads (indirect costs)			
Depreciation – plant and machinery		3 130	
Factory supervisor's salary		14 771	
Depreciation – building (working 1)		800	

	£	£	£
Factory electricity		7 898	
Factory insurance		5 790	
Sundry factory expenses		1 770	
Machinery repairs and maintenance		8 599	
Factory cleaning		5 777	
			48 535
Add: opening work-in-progress			6 440
Less: closing work-in-progress			(6 693)
Factory cost of finished goods			225 469

b) Profit and loss and balance sheet

Ermintrude: Profit and loss account for the year ending 31 December 20X8

	£	£
Sales		
Cost of sales		337 570
Opening stock of finished goods	39 451	
Add: factory cost of finished goods [from manufacturing account]	225 469	
	264 920	
Less: closing stock of finished goods	(39 750)	
Cost of sales		(225 170)
Gross profit		112 400
Expenses		
Depreciation – building (working 1)	200	
Secretarial and clerical staff	12 760	
Business rates	6 769	
Electricity and gas (working 4)	3 736	
Office telephone	4 644	
Delivery van expenses	3 890	
Sales staff costs	17 231	
Depreciation – motor vehicles (working 2)	5 600	
Depreciation – office equipment (working 3)	1 300	
Accountant's fees (working 5)	1 300	
Sundry administration and selling expenses	1 670	
Interest paid	1 830	
		(60 930)
Net profit		51 470

Ermintrude: Balance sheet at 31 December 20X8

	£ Cost	£ Depreciation	£ Net book value
Fixed assets			
Land	13 850	—	13 850
Buildings	50 000	10 000	40 000
Plant and machinery	93 450	90 612	2 838

	£	£	£
Motor vehicles	39 822	23 022	16 800
Office equipment	13 000	3 900	9 100
	210 122	127 534	82 588
Current assets			
Stocks:			
Raw materials	16 333		
Work-in-progress	6 693		
Finished goods	39 750		
		62 776	
Debtors		46 242	
		109 018	
Current liabilities			
Bank overdraft		28 411	
Creditors		24 459	
Accrual (working 6)		2 217	
		55 087	
Net current assets			53 931
			136 519
Long-term liability: loan			(10 000)
			126 519
Capital			
Capital at 1 January 20X8			114 560
Add: profit for the year			51 470
Less: drawings			(39 511)
			126 519

c) Advice

Although Ermintrude's business is profitable it is short of cash. Her overdraft and long-term borrowings from the bank total £38 411. It would be necessary to know more about the way her business works in order to be able to give her detailed advice. However, a brief review of the balance sheet suggests that a lot of cash is tied up in stock – over £60 000. Ermintrude could review her production process and order book, to see if the total can be reduced. Also, there may be scope to reduce debtors by reminding them to pay more promptly.

The business owns its own property. It appears from the depreciation accumulated that it was bought about 10 years ago. It may now be worth more than the net book value at which it is stated in the balance sheet. The bank might agree to advance Ermintrude a mortgage loan, secured on the value of land and buildings. Investment in new and up-to-date plant and machinery could help to increase profitability and it may well be worth borrowing money to do this. Ermintrude needs to carry out a thorough analysis and to calculate forecast savings in order to assess whether or not the investment is worthwhile.

10 Ulrike

Working 1: depreciation of machinery

Cost = £7290. Depreciation for the year = £7290 × 10% = £729

Working 2: depreciation of office fittings and computer

Cost = £4080. Depreciation for the year = £4080 × 10% = £408

Manufacturing account for the year ending 31 December 20X2

	£	£	£
Direct materials			
Opening stock of raw materials	6 862		
Add: purchases	35 279		
Less: purchases returns	(815)		
	41 326		
Less: closing stock of raw materials	(5 988)		
		35 338	
Direct labour		32 406	
Total direct costs (prime cost)			67 744
Production overheads			
Depreciation of machinery (working 1)		729	
Rent and rates for factory unit		16 602	
Factory repairs and maintenance		472	
Factory cleaning and security		803	
Insurance (£1200 × 80%)		960	
Factory heat and light		3 966	
Other factory costs		6 828	
Total production overheads			30 360
Factory cost of finished goods			98 104
Add: work-in-progress at 1 January 20X2			3 370
Less: work-in-progress at 31 December 20X2			(3 961)
Factory cost of finished goods			97 513

Ulrike: Profit and loss account for the year ending 31 December 20X2

	£	£
Sales		136 800
Opening stock of finished goods	12 269	
Add: factory cost of finished goods	97 513	
	109 782	
Less: closing stock of finished goods	(13 604)	
		96 178
Gross profit		40 622
Expenses		
Part-time administrator's salary	8 288	

	£	£
Depreciation of office fittings and computer (working 2)	408	
Office telephone (£1362 + 472)	1 834	
Insurance (£1200 × 20%)	240	
Office rental	2 800	
Office heat and light	982	
Selling and distribution costs	3 996	
Accountancy and tax advice	700	
Sundry office expenses	2 866	
Interest paid	407	
		22 521
Net profit		18 101

Ulrike: Balance sheet at 31 December 20X2

	£	£	£
Fixed assets			
Machinery at cost		7 290	
Less: depreciation (£3645 + 729)		(4 374)	
			2 916
Office fittings and computer at cost		4 080	
Less: depreciation (£2448 + 408)		(2 856)	
			1 224
			4 140
Current assets			
Stocks:			
Raw materials	5 988		
Work-in-progress	3 961		
Finished goods	13 604		
		23 553	
Debtors		19 489	
		43 042	
Current liabilities			
Trade creditors		9 980	
Creditor for VAT		1 026	
Accrual		472	
Bank overdraft		6 260	
		17 738	
Net current assets			25 304
			29 444
Capital			
Capital at 1 January 20X2			28 593
Add: profit for the year			18 101
Less: drawings			(17 250)
			29 444

Ulrike: Report on business performance for the year ending 31 December 20X2

Gross profit margin is 29.7% (£40 622/136 800 × 100) and net profit margin is 13.2% (£18 101/136 800 × 100). Both gross and net margins are worse than those normally achieved by the business and it appears that performance is declining. More information would be needed to identify the problems. It may be that margins are under pressure because of competition and/or an inability to pass on price increases in raw materials. Costs may not be sufficiently well controlled.

The business has no cash resources. The bank manager may be reluctant to make a long-term loan when the bank overdraft already exceeds £6000. It is noticeable that stocks are higher at the end of the year than at the beginning and it may be that the business is carrying excessive quantities of stock. If the stock figure could be reduced this would ease the pressure on cash. Also, the business is owed almost £20 000 by its debtors at the year end. If this figure could be reduced by persuading debtors to pay more quickly (perhaps using the incentive of a discount for early payment) borrowings could be reduced.

It seems likely that, if the bank were to make a loan, some kind of security or guarantee would have to be provided. The fixed assets of the business are of low value, and the bank may not wish to secure its loan on the basis of the current assets. It is quite possible that the bank would require a personal guarantee from Ulrike or security in the form, perhaps, of a charge over her house or flat (if she owns one).

Ulrike should probably try to improve her business cash position before approaching the bank for a loan. Also, she needs to identify the reasons for the decline in profitability and take steps to address them.