6

Further Standard Costing

Further Standard Costing

6

Learning Outcomes

After completing this chapter, you should be able to:

- prepare a statement that reconciles budgeted contribution with actual contribution;
- interpret statements of variances for variable costs, sales prices and sales volumes including possible inter-relations between cost variances, sales price and volume variances, and cost and sales variances;
- discuss the possible use of standard labour costs in designing incentive schemes for factory and office workers.

6.1 Introduction

In this chapter you will be continuing your studies of standard costing and variance analysis. You will learn how to put all the variances together in a statement which reconciles the budgeted contribution for a period with the actual contribution achieved.

You will also be learning how to interpret variances and how standard labour costs can be used in designing incentive schemes.

6.2 Reconciling actual contribution with budgeted contribution

Now that you have seen how to calculate all the main variable cost and sales variances, you should be in a position to produce a statement which reconciles the actual and budget contribution for the period.

First, to get some important practice, you should calculate all of the variances using the data given in the following example. Then you can learn to put all the variances together in a reconciliation statement like the one shown at the end of the solution.

Example

A company produces and sells one product only, the standard variable cost for which is:

	£ per unit
Direct material 11 litres at £2	22
Direct labour 5 hours at £6	30
Variable production overhead	10
Total standard variable cost	62
Standard contribution	58
Standard selling price	120

The variable production overhead is incurred in direct proportion to the direct labour hours worked. The budgeted sales volume for May was 2,000 units.

The following were the actual results recorded during May:

Number of units produced and sold: 1,750

	£	£
Sales revenue		218,750
Direct materials: 19,540 litres purchased and used	41,034	
Direct labour: 8,722 hours	47,971	
Variable production overhead	26,166	
		115,171
Contribution		103,579

You are required to calculate the operating variances and present them in a statement which reconciles the budget and actual contribution for May.

Solution

Direct material price variance

	£	
19,540 litres purchased should have cost (×£2)	39,080	
But did cost	41,034	
Direct material price variance	1,954	adverse

Direct material usage variance

	Litres	
1,750 units produced should have used (×11 litres)	19,250	
But did use	19,540	
Variance in litres	290	adverse
× standard price per litre (£2)		
Direct material usage variance	£580	adverse

Direct labour rate variance

	£	
8,722 hours should have cost (×£6)	52,332	
But did cost	47,971	
Direct labour rate variance	4,361	favourable

Direct labour efficiency variance

	Hours	
1,750 units produced should take (×5 hours)	8,750	
But did take	8,722	
Variance in hours	28	favourable
× standard labour rate per hour (£6)		
Direct labour efficiency variance	£168	favourable

Variable production overhead expenditure variance

	£	
8,722 hours of variable production overhead should cost (×£2)	17,444	
But did cost	26,166	
Variable production overhead expenditure variance	8,722	adverse

Variable production overhead efficiency variance

Variance in hours (from labour efficiency variance)	28	favourable
× standard variable overhead rate per hour (£2)		
Variable production overhead efficiency variance	£56	favourable

Sales price variance

	£	
1,750 units should sell for (×£120)	210,000	
But did sell for	218,750	
Sales price variance	8,750	favourable

Sales volume contribution variance

Actual sales volume	1,750	units
Budget sales volume	2,000	units
Sales volume variance in units	250	adverse
× standard contribution per unit	×£58	
Sales volume contribution variance	£14,500	adverse

A reconciliation statement, known as an *operating statement*, begins with the original budgeted contribution. It then adds or subtracts the variances (depending on whether they are favourable or adverse) to arrive at the actual contribution for the month.

Contribution reconciliation statement for May

		£	£
Original budgeted contribution: 2,000 units × £58			116,000
Sales volume contribution variance			(14,500)
Standard contribution from actual sales volume			101,500
Sales price variance			8,750
Cost variances			110,250
Direct material:	price	(1,954)	
	usage	(580)	
			(2,534)
Direct labour:	rate	4,361	
	efficiency	168	
			4,529
Variable production overhead:	expenditure	(8,722)	
	efficiency	56	
			(8,666)
Actual contribution			103,579

Note: Variances in brackets are adverse.

6.3 Idle time variances

You may come across a situation which involves idle time. Idle time occurs when labour is available for production but is not engaged in active production due to, for example, shortage of work or material.

During idle time, direct labour wages are being paid but no output is being produced. The cost of this can be highlighted separately in an idle time variance, so that it is not 'hidden' in an adverse labour efficiency variance. In this way, management attention can be directed towards the cost of idle time.

Variable production overhead variances can also be affected by idle time. It is usually assumed that variable production overhead expenditure is incurred in active hours only – for example, only when the machines are actually running, incurring power costs, etc. – therefore variable production overhead expenditure is not being incurred during idle hours. The variable production overhead efficiency variance is affected in the same way as the labour efficiency variance.

Example

To demonstrate this, suppose that in the last example you were given the following additional information about the actual results recorded during May.

Of the 8,722 hours of direct labour paid for, 500 hours were idle because of a shortage of material supplies. An idle time variance could be calculated as follows:

Idle time variance

Idle hours × standard labour rate per hour

= 500 × £6
= £3,000 adverse

This is the standard cost of wages incurred during the idle time.

These idle hours must be eliminated from the calculation of the labour efficiency variance, so that the efficiency of labour is being measured only during the hours when they were actually working. This gives a much more meaningful measure of labour efficiency.

Direct labour efficiency variance

	Hours	
1,750 units produced should have taken (×5 hours)	8,750	
But did take (active hours)	8,222	
Variance in hours	528	favourable
× standard labour rate per hour (£6)		
Direct labour efficiency variance	£3,168	favourable

The total of these two variances is the same as the original labour efficiency variance (£168 favourable). The effect on the variable production overhead variances would be as follows:

Variable production overhead expenditure variance

	£	
8,222 active hours of variable production overhead should cost (×£2)	16,444	
But did cost	26,166	
Variable production overhead expenditure variance	9,722	adverse

Variable production overhead efficiency variance

	Hours	
1,750 units produced should have taken (×5 hours)	8,750	
But did take (active hours)	8,222	
Variance in hours	528	favourable
× standard variable overhead rate per hour (£2)		
Variable production overhead efficiency variance	£1,056	favourable

The total of £8,666 adverse for the two variable production overhead variances is not affected by the idle time (you should check this for yourself). However, we have now measured efficiency during active hours only, and we have allowed variable production overhead expenditure only for active hours.

6.4 Interpreting variances

6.4.1 The reasons for variances

There are many possible causes of variances, ranging from errors in setting the standard cost to efficiencies and inefficiencies of operations. Table 6.1 shows the possible causes of variances. This table is not exhaustive, but it will give you an idea of the range of possible causes.

In an assessment question, you should review the information given and select any feasible cause that is consistent with the variance in question: that is, if the variance is favourable you must select a cause that would result in a favourable variance.

Table 6.1 Causes of variances

Variance	Favourable	Adverse
Material price	Standard price set too high Unexpected discounts available Lower-quality material used Careful purchasing Gaining bulk discounts by buying larger quantities	Standard price set too low Unexpected general price increase Higher-quality material used Careless purchasing Losing bulk discounts by buying smaller quantities
Material usage	Standard usage set too high Higher-quality material used A higher grade of worker used the material more efficiently Stricter quality control	Standard usage set too low Lower-quality material used A lower grade of worker used the material less efficiently Theft
Labour rate	Standard rate set too high Lower grade of worker used	Standard rate set too low Higher grade of worker used Higher rate due to wage award
Labour efficiency	Standard hours set too high Higher grade of worker Higher grade of material was quicker to process More efficient working through improved motivation	Standard hours set too low Lower grade of worker Lower grade of material was slower to process Less efficient working due to poor motivation
Idle time		Shortage of work Machine breakdown Shortage of material
Variable overhead expenditure	Standard hourly rate set too high	Standard hourly rate set too low
	Overheads consist of a number of items: indirect materials, indirect labour, maintenance costs, power, etc., which may change because of rate changes or variations in consumption. Consequently, any meaningful interpretation of the expenditure variance must focus on individual cost items.	
Variable overhead efficiency	See labour efficiency variance	
Sales price	Higher quality product commanded higher selling price than standard	Increased competition forced a reduction in selling price below standard
Sales volume contribution	Increased marketing activity led to higher than budgeted sales volume	Quality control problems resulted in lower than budgeted sales volumes

6.4.2 The significance of variances

Once the variances have been calculated, management has the task of deciding which variances should be investigated. It would probably not be worthwhile or cost effective to investigate every single variance. Some criteria must be established to guide the decision as to whether or not to investigate a particular variance.

Factors which may be taken into account include the following:

(a) *The size of the variance*. Costs tend to fluctuate around a norm and therefore 'normal' variances may be expected on most costs. The problem is to decide how large a variance must be before it is considered 'abnormal' and worthy of investigation.

A rule of thumb may be established that any variance which exceeds, say, five per cent of its standard cost may be worthy of investigation. Alternatively, control limits may be set statistically and if a cost fluctuates outside these limits it should be investigated.

(b) *The likelihood of the variance being controllable*. Managers may know from experience that certain variances may not be controllable even if a lengthy investigation is undertaken to determine their causes. For example, it might be argued that a material price variance is less easily controlled than a material usage variance because it is heavily influenced by external factors.

(c) *The likely cost of an investigation*. This cost would have to be weighed against the cost which would be incurred if the variance was allowed to continue in future periods.

(d) *The interrelationship of variances*. Adverse variances in one area of the organisation may be interrelated with favourable variances elsewhere. For example, if cheaper material is purchased this may produce a favourable material price variance. However, if the cheaper material is of lower quality and difficult to process, this could result in adverse variances for material usage and labour efficiency.

(e) *The type of standard that was set*. You have already seen that an ideal standard will almost always result in some adverse variances, because of unavoidable waste, etc. Managers must decide on the 'normal' level of adverse variance which they would expect to see.

Another example is where a standard price is set at an average rate for the year. Assuming that inflation exists, favourable price variances might be expected at the beginning of the year, to be offset by adverse price variances towards the end of the year as actual prices begin to rise.

A detailed knowledge of the significance of variances is outside the scope of your *Fundamentals of Management Accounting* syllabus. However, you should now be aware that the use of standard costing systems for control purposes does not end with the calculation of the variances.

Exercise

In (d) above we mention one possible interrelationship that might exist between cost variances. Following this example, can you think of a possible interrelationship that might exist:

(i) between other cost variances;
(ii) between the sales price and sales volume contribution variance;
(iii) between cost and sales variances.

Solution

You might have thought of other, equally valid suggestions in addition to those below.

(i) *Possible interrelationship between cost variances*
Employing a higher grade of labour than standard might produce an adverse labour rate variance. However, if these employees are more skilled than standard they may work more quickly and efficiently, resulting in a favourable labour efficiency variance and a favourable variable overhead efficiency variance.

(ii) *Possible interrelationship between the sales price and sales volume contribution variance*
Charging a higher selling price than standard will produce a favourable sales price variance. However, the higher price might deter customers and thus sales volumes might fall below budget, resulting in an adverse sales volume contribution variance.

(iii) *Possible interrelationship between cost and sales variances*
Purchasing a higher quality material than standard might produce an adverse material price variance. However, the quality of the finished product might be higher than standard and it might be possible to command higher selling prices, thus producing a favourable sales price variance. Furthermore, the higher quality product might attract more customers to buy which could result in a favourable sales volume contribution variance.

6.5 Standard hour

Sometimes it can be difficult to measure the output of an organisation which manufactures a variety of dissimilar items. For example, if a company manufactures metal saucepans, utensils and candlesticks, it would not be meaningful to add together these dissimilar items to determine the total number of units produced. It is likely that each of the items takes a different amount of time to produce and utilises a different amount of resource.

A standard hour is a useful way of measuring output when a number of dissimilar items are manufactured. A standard hour or minute is the amount of work achievable, at standard efficiency levels, in an hour or minute.

The best way to see how this works is to look at an example.

Example

A company manufactures tables, chairs and shelf units. The standard labour times allowed to manufacture one unit of each of these are as follows:

	Standard labour hours per unit
Table	3 hours
Chair	1 hour
Shelf unit	5 hours

Production output during the first two periods of this year was as follows:

	Units produced	
	Period 1	*Period 2*
Table	7	4
Chair	5	2
Shelf unit	3	5

It would be difficult to monitor the trend in total production output based on the number of units produced. We can see that 15 units were produced in total in period 1 and 11 units in period 2. However, it is not particularly meaningful to add together tables, chairs and shelf units because they are such dissimilar items. You can see that the mix of the three products changed over the two periods and the effect of this is not revealed by simply monitoring the total number of units produced.

Standard hours present a useful output measure which is not affected by the mix of products. The standard hours of output for the two periods can be calculated as follows:

		Period 1		Period 2	
	Standard hours per unit	*Units produced*	*Standard hours*	*Units produced*	*Standard hours*
Table	3	7	21	4	12
Chair	1	5	5	2	2
Shelf unit	5	3	15	5	25
Total standard labour hours produced			41		39

Expressing the output in terms of standard labour hours shows that in fact the output level for period 2 was very similar to that for period 1.

It is important for you to realise that the actual labour hours worked during each of these periods was probably different from the standard labour hours produced. The standard hours figure is simply an expression of how long the output should have taken to produce, to provide a common basis for measuring output.

The difference between the actual labour hours worked and the standard labour hours produced will be evaluated as the labour efficiency variance.

6.6 Labour incentive schemes

Standard labour times can be useful in designing incentive schemes for factory and office workers. For example, if a standard time has been established for a particular task an employee might be paid a bonus if the task is completed in less than the standard time.

Knowledge of the standard labour costs can assist managers in devising a labour incentive scheme that provides an incentive for the employee while at the same time being cost-effective for the organisation.

6.6.1 Bonus schemes

A variety of bonus and incentive schemes exist in practice. They are all similar and are designed to increase productivity.

The schemes rely on the setting of a standard time to achieve a task and the comparison of the actual time taken with the standard time. The savings which result from the employee's greater efficiency are usually shared between the employee and the employer on a proportionate basis. Usually the employee receives between 30 and 60 per cent of the time saved as a bonus number of hours paid at the normal hourly rate.

Example

John is a skilled engineer, paid £15 per hour. Each job he does has a standard time allowance and he is paid 50 per cent of any time he saves each week as a bonus paid at his hourly rate.

During week 11 John worked for 40 hours and completed jobs having a total standard time allowed of 47 hours.

John's earnings were:

	£
40 hours × £15	600.00
Bonus 3.5 hours* × £15	52.50
Total earnings	652.50

* Seven hours were saved against the total standard hours allowed, so 3.5 bonus hours are paid.

A wide variety of incentive and bonus schemes exist. In the assessment you must read the description of the scheme carefully before you apply it to the data supplied.

Note that incentive schemes based on a standard time allowance can be applied to office workers as well as to factory workers. For example, a standard time might be set for processing an invoice. At the end of a period the number of standard hours of work represented by the number of invoices processed by a particular employee can be measured. If the employee has saved time against this standard allowance then a bonus can be paid to the employee as a reward for performance above standard.

6.6.2 Piecework systems

If remuneration is based on piecework an employee is paid according to the output achieved, regardless of the time taken.

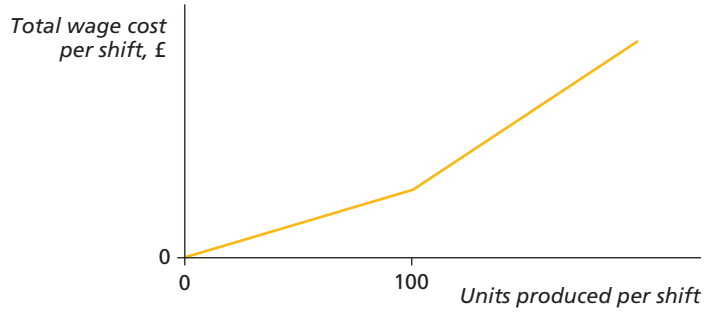
A payment rate per unit produced is agreed in advance. Knowledge of standard labour times will help managers to decide on the amount that will be paid for each unit produced.

A variation of the basic piecework principle is for the organisation to set a daily target level of activity, based on the standard labour time per unit. The employee is then paid a higher rate per unit for those completed in excess of the target.

Example

Dave is employed on a part-time basis by K Limited. He is paid £0.40 for each unit he produces up to 100 units per shift. Any units produced above this target are paid at £0.50 per unit. Last shift he produced 108 units. His earnings that shift were:

	£
100 @ £0.40	40
8 @ £0.50	4
	44



A sketch graph of this piecework system would look like this (not to scale):
The gradient of the graph becomes steeper when output exceeds 100 units per shift.

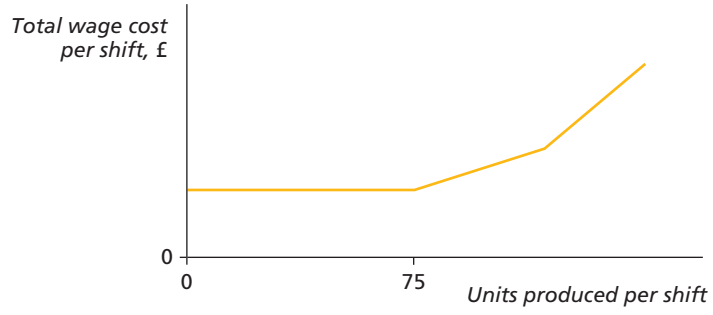
6.6.3 Guaranteed minimum wage

A guaranteed minimum wage may be included within a piecework system. It protects employees by guaranteeing them a minimum weekly wage based on an hourly rate multiplied by the employee's number of attendance hours. Note that this is only applied if the level of piecework earnings is below this guaranteed minimum level.

Example

If Dave (see Section 6.6.2) had only produced 50 units but was entitled to a guaranteed minimum wage of £30 per shift, he would receive £30 even though his piecework earnings were only 50 × £0.40 = £20.

A sketch graph of this piecework system would look like this (not to scale):



The wages cost remains constant at £30 per shift, until output reaches 75 units (75 × £0.40 = £30). After this point the wages cost increases according to the rate per unit, as before.

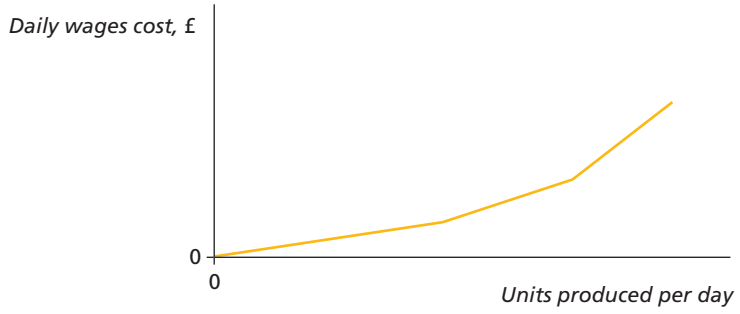
6.6.4 Differential piece rate

Using this system a target number of units is set and different rates per unit are paid depending upon the total number of units achieved. Usually a daily target is used. For example:

Units produced in a day	£
1–100 units	0.40 each
101–129 units	0.42 each
130 units and above	0.44 each

You should note that it is usual for the higher rates to apply only to the additional units, not to all of the units achieved.

A sketch graph of a differential piece-rate system would look like this (not to scale):



The gradient of the graph becomes progressively steeper with each successive increase in the rate paid per unit.

6.6.5 Piecework hours

A piecework hour is the same in principle as the standard hour that you learned about earlier in this chapter. Piecework hours are used to measure the output when employees are paid according to a piecework scheme and dissimilar items are produced. A standard piecework time allowance is determined for each unit produced.

Example

Employee number 297 is paid a guaranteed wage of £170 per week plus £3 per piecework hour produced. Last week the employee produced the following output.

Product	*Number of units produced*	*Standard piecework hours per unit*
R	40	0.7
T	30	0.3

The number of standard piecework hours produced is (40 × 0.7) + (30 × 0.3) = 37
Wages for last week = £170 + (37 piecework hours × £3) = £281

6.6.6 Group incentive schemes

Bonus or incentive schemes based on standard time allowances can be applied to groups as well as to individuals. Group incentive schemes might be appropriate in circumstances such as:

- when it is not possible to set a standard for and to measure individual performance – for example, in an office;
- when operations are performed by a group or team and not by individuals working alone – for example, road repairs or refuse collections;
- where production is integrated and increased output depends on a number of people all making extra effort – for example, in production line manufacture such as that in the automobile industry.

Example

A team of three clerks produces a detailed credit control report for a company's monthly management meeting. The standard time allowed for production of the report is 18 labour hours. A bonus of £9 per hour saved against this time allowance is paid to the team, divided equally between the three clerks. The time taken to produce the report last month was as follows:

Clerk no.	Time taken (hours)
1	2
2	3
3	5

Time saved against standard allowance = 18 hours allowance − 10 hours taken
= 8 hours
Bonus payable per clerk = (8 × £9)/3 = £24

6.7 Summary

Having read this chapter the main points that you should understand are as follows:

1. Sales and variable cost variances can be combined in a statement that reconciles the budgeted contribution with the actual contribution achieved during a period. Favourable variances are added to the budgeted contribution and adverse variances are deducted to arrive at the actual contribution.
2. The idle time variance is always adverse. It is calculated as the number of hours idle multiplied by the standard labour rate per hour. If there is idle time then the variances for labour efficiency, variable production overhead efficiency and variable production overhead expenditure should be based on active hours only.
3. It is not always worth investigating every variance. Some criteria must be established to guide the decision as to whether or not to investigate a particular variance.
4. Variances might be interrelated so that one variance might be a direct result of another variance. It is important to consider possible interrelationships between variances before embarking on detailed investigations as to their cause.
5. Knowledge of the standard labour cost can provide the basis for designing incentive schemes based on standard time allowances or on piecework.
6. A differential piece rate system pays different rates per unit depending on the output achieved.

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Revision Questions

6

Question 1 Multiple choice

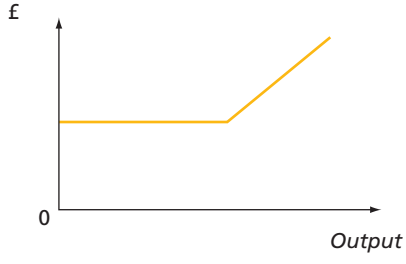
1.1 The following data relates to an employee in production department A:

Normal working day	7 hours
Hourly rate of pay	£8
Standard time allowed to produce one unit	6 minutes
Bonus payable at basic hourly rate	50% of time saved

What would be the gross wages payable in a day when the employee produces 82 units?

(A) £33.60
(B) £60.80
(C) £65.60
(D) £84.00

1.2



The labour cost graph above depicts:

(A) a piece-rate scheme with a minimum guaranteed wage.
(B) a straight piece-rate scheme.
(C) a time-rate scheme, where the employee is paid for each hour of attendance.
(D) a differential piece-rate scheme.

Data for questions 1.3–1.5

The standard direct labour cost of one unit of product Q is £3.00 (0.25 hours × £12.00).

The eight employees who make product Q work a 7-hour day. In a recent 3-day period, results were as follows:

Actual units produced	650 units
Actual labour cost	£2,275

During this period, there was a power failure. This meant that all work had to stop for 2 hours.

1.3 If the company reports idle time separately, the labour efficiency variance for the period is:

(A) £126 favourable
(B) £142 favourable
(C) £66 adverse
(D) £126 adverse

1.4 The labour rate variance for the period is:

(A) £259 favourable
(B) £259 adverse
(C) £325 favourable
(D) £325 adverse

1.5 The idle time variance for the period is:

(A) £24 adverse
(B) £24 favourable
(C) £192 adverse
(D) £192 favourable

Question 2 Short objective-test questions

2.1 The direct material usage variance for last period was £3,400 adverse. Which of the following reasons could have contributed to this variance? (Tick all that apply.)

(a) Output was higher than budgeted. ☐
(b) The purchasing department bought poor quality material. ☐
(c) The original standard usage was set too high. ☐
(d) Market prices for the material were higher than expected. ☐
(e) An old, inefficient machine was causing excess wastage. ☐

2.2 If employees are more skilled than had been allowed for in the original standard cost, which *four* of the following variances are most likely to result?

(a) favourable material usage; ☐
(b) adverse material usage; ☐
(c) favourable labour efficiency; ☐
(d) adverse labour efficiency; ☐
(e) favourable labour rate; ☐
(f) adverse labour rate; ☐
(g) favourable variable overhead efficiency; ☐
(h) adverse variable overhead efficiency; ☐

2.3 The budgeted contribution for last month was £43,900 but the following variances arose:

	£	
Sales price variance	3,100	adverse
Sales volume contribution variance	1,100	adverse
Direct material price variance	1,986	favourable
Direct material usage variance	2,200	adverse
Direct labour rate variance	1,090	adverse
Direct labour efficiency variance	512	adverse
Variable overhead expenditure variance	1,216	favourable
Variable overhead efficiency variance	465	adverse

The actual contribution for last month was £ ☐

2.4 Extracts from the standard cost card for product N are as follows:

	£
Direct labour: 14 hours @ £11 per hour	154
Variable production overhead: 14 hours @ £3 per hour	42

During the latest period, 390 units of product N were produced. Details concerning direct labour and variable production overhead are as follows:

Direct labour: amount paid for 5,720 hours = £68,640
Variable production overhead cost incurred = £16,280

Of the 5,720 labour hours paid for, 170 hours were recorded as idle time due to a machine breakdown.

Calculate the following variances and tick the correct box to indicate whether each variance is adverse or favourable:

	Adverse	*Favourable*
(a) the direct labour rate variance is £ ☐	☐	☐
(b) the direct labour efficiency variance is £ ☐	☐	☐
(c) the idle time variance is £ ☐	☐	☐
(d) the variable production overhead expenditure variance is £ ☐	☐	☐
(e) the variable production overhead efficiency variance is £ ☐	☐	☐

2.5 An office worker who processes insurance claims is paid an hourly wage of £9 per hour plus a bonus based on the time saved to process claims compared with a standard time allowance. The bonus paid is 40 per cent of the time saved, at the basic hourly rate.

Last week the employee worked 30 hours and processed the following claims.

	Number of claims processed	*Standard hours allowed per claim*
Motor insurance	11	2
Household contents	15	1
Travel insurance	4	0.5

(a) The number of standard hours of work produced last week was ☐.
(b) The total wage payable to the employee for the week is (to the nearest penny) £ ☐.

Question 3 Standard costing in a service organisation

Carshine Services employs a number of people providing a car cleaning and valeting service which operates in the car parks of local supermarkets and railway stations. In an attempt to control costs and revenues the company has established the following standard cost and fee per car cleaned and valeted:

	£ per car
Materials: shampoo/polish: 0.5 litres @ £2.00 per litre	1.00
Labour: 0.75 hour @ £6 per hour	4.50
Total variable cost	5.50
Standard contribution	4.50
Standard fee per car	10.00

Carshine services expects to clean and valet 3,000 cars each month. In March, a total of 2,800 cars were cleaned and the following costs and revenues were recorded:

	£	£
Sales revenue		28,050
Shampoo/polish: 1,460 litres	2,800	
Labour: 2,020 hours	12,726	
		15,526
Contribution		12,524

Requirements

The following cost and sales variances will be recorded for March. Tick the box to indicate whether each variance is adverse or favourable

		Adverse	*Favourable*
(a) material price:	£ ☐	☐	☐
(b) material usage:	£ ☐	☐	☐
(c) labour rate:	£ ☐	☐	☐
(d) labour efficiency:	£ ☐	☐	☐
(e) sales price:	£ ☐	☐	☐
(f) sales volume contribution:	£ ☐	☐	☐

Solutions to Revision Questions

6

Solution 1

- Every bonus scheme is different. In question 1.1 you will need to read the information carefully to ensure that you understand the principles, then follow these principles to calculate the correct bonus – and do not forget to add the basic pay to the bonus to arrive at the total amount payable!

1.1 Answer: (B)

	Minutes
Time allowed: 82 units × 6 min	492
Time taken: 7 hours	420
Time saved	72

	£
Bonus payable:	
50% × 72 min × £8 per hour	4.80
Basic wage: 7 hours × £8	56.00
Gross wages payable	60.80

1.2 Answer: (A)

The minimum guaranteed wage is shown as a fixed cost up to a certain output. Thereafter, the total cost increases at a steady rate, as piecework rates are paid for increased output.

1.3 Answer: (A)

650 units should take (×0.25)	162.5 active hours
But did take (7 hours × 3 days × 8 employees) − (8 × 2 hours)	152.0 active hours
	10.5 (F) h × £12.00
Labour efficiency variance	£126 (F)

1.4 Answer: (B)

	£	
168 hours should cost (×£12.00)	2,016	
But did cost	2,275	
Labour rate variance	259	adverse

1.5 Answer: (C)

Idle time variance = 2 hours × 8 employees = 16 hours idle × £12 per hour = £192 adverse.

Solution 2

2.1 (b) Poor quality material could have led to higher wastage.
(e) Excess wastage causes an adverse material usage variance.

A higher output (a) would not in itself cause an adverse usage variance, because the expected usage of material would be flexed according to the actual output achieved.

Setting the original standard usage too high (c) is likely to lead to favourable usage variances.

Higher market prices (d) would cause adverse material price variances.

2.2 (a) Highly skilled employees may use material more efficiently.
(c) Highly skilled employees may work more quickly.
(f) Highly skilled employees are likely to be paid a higher hourly rate.
(g) Highly skilled employees may work more quickly.

2.3 The actual contribution for last month was £38,635.

Workings:

When working from the budgeted contribution to the actual contribution, adverse variances are deducted from the budgeted contribution; favourable variances are added to the budgeted contribution.

£(43,900 − 3,100 − 1,100 + 1,986 − 2,200 − 1,090 − 512 + 1,216 − 465) = £38,635.

2.4 (a) Direct labour rate variance = £5,720 adverse
(b) Direct labour efficiency variance = £990 adverse
(c) Idle time variance = £1,870 adverse
(d) Variable production overhead expenditure variance = £370 favourable
(e) Variable production overhead efficiency variance = £270 adverse

Workings

(a)

	£	
5,720 hours paid for should cost (×£11)	62,920	
But did cost	68,640	
Direct labour rate variance	5,720	adverse

(b)

	Hours	
390 units should take (×14)	5,460	
But did take (active hours = 5,720 − 170)	5,550	
Variance in hours	90	adverse
× standard labour rate per hour (£11)		
Direct labour efficiency variance	£990	adverse

(c) Idle time variance = 170 hours × £11 standard rate = £1,870 adverse

(d)

	£	
Variable overhead cost of 5,550 active hours should be (×£3)	16,650	
Actual variable overhead cost	16,280	
Variable production overhead expenditure variance	370	favourable

(e)

Efficiency variance in hours (from labour efficiency variance)	90	adverse
× standard variable production overhead rate per hour	£3	
Variable production overhead efficiency variance	£270	adverse

2.5 (a) The number of standard hours of work produced last week was 39.
(b) The total wage payable to the employee for the week is £302.40.

	Number of claims processed	*Standard hours allowed per claim*	*Standard hours produced*
Motor insurance	11	2	22
Household contents	15	1	15
Travel insurance	4	0.5	2
Total standard hours produced			39
Time taken			30
Time saved (hours)			9

Basic wage payable = 30 hours × £9 = £270
Bonus = 40% × 9 hours saved × £9 = £32.40
Total wage payable = £270 + £32.40 = £302.40

Solution 3

- Do not be put off by the fact that this is a service organisation. An important point to learn from this question is that the variance calculations in a service organisation are no different from those in a manufacturing organisation.
- Remember to indicate whether your calculated variances are adverse or favourable.
- As an additional exercise, have a go at putting together all your calculated variances into a statement which reconciles the budgeted contribution with the actual contribution for the month.

(a) £120 favourable
(b) £120 adverse
(c) £606 adverse
(d) £480 favourable
(e) £50 favourable
(f) £900 adverse

Workings:
Material price variance

	£	
1,460 litres should have cost (×£2)	2,920	
But did cost	2,800	
Material price variance	120	favourable

Material usage variance

	Litres	
2,800 cars should have used (×0.5 litres)	1,400	
But did use	1,460	
Variance in litres	60	adverse
× standard price per litre (£2)		
Material usage variance	£120	adverse

Labour rate variance

	£	
2,020 hours should have cost (×£6)	12,120	
But did cost	12,726	
Labour rate variance	606	adverse

Labour efficiency variance

	Hours	
2,800 cars should have taken (×0.75 hour)	2,100	
But did take	2,020	
Variance in hours	80	favourable
× standard rate per hour (£6)		
Labour efficiency variance	£480	favourable

Sales price variance

	£	
Revenue for 2,800 cars should be (×£10)	28,000	
But actual revenue was	28,050	
Sales price variance	50	favourable

Sales volume contribution variance

Actual cars cleaned	2,800	cars
Budgeted cars cleaned	3,000	cars
Sales volume variance in cars	200	adverse
× standard contribution per car	×£4.50	
Sales volume contribution variance	£900	adverse

Solution to additional exercise

Statement reconciling the budgeted contribution for March with the actual contribution achieved

		£
Budgeted contribution (3,000 cars × £4.50)		13,500
Sales volume contribution variance		(900)
Standard contribution from actual volume achieved		12,600
Sales price variance		50
		12,650
Cost variances		
Material price	120	
Material usage	(120)	
		–
Labour rate	(606)	
Labour efficiency	480	
		(126)
Actual contribution		12,524

Note: variances in brackets are adverse

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