Answers

1 (a) Costs and quoted prices for the GC and the EX using labour hours to absorb overheads:

			GC $	EX $
Materials			3,500	8,000
Labour	300hrs x $15/hr		4,500	
		500hrs x $15/hr		7,500
Overheads	300hrs x $10/hr (W1)		3,000	
		500hrs x $10/hr		5,000
Total cost			11,000	20,500
Quoted price			16,500	30,750

(W1). Overhead absorption rate is calculated as $400,000/40,000hrs = $10/hr

(b) Costs and quoted prices for the GC and the EX using ABC to absorb overheads:

			GC $	EX $
Materials			3,500	8,000
Labour	300hrs x $15/hr		4,500	
		500hrs x $15/hr		7,500
Overheads				
– Supervisor	(W2)/(W3)		180	1,080
– Planners	(W2)/(W3)		280	1,400
– Property	(W2)/(W3)		1,800	3,000
Total cost			10,260	20,980
Quoted price			15,390	31,470

(W2)

	Costs	Number of drivers	Cost per driver
Supervisor	90,000	500	180
Planners	70,000	250	280
Property	240,000	40,000	6

(W3)

	Supervisor	Planner	Property
Cost per driver (W2)	$180	$280	$6
GC	180 x 1 = 180	280 x 1 = 280	6 x 300 = 1,800
EX	180 x 6 = 1,080	280 x 5 = 1,400	6 x 500 = 3,000

(c) The pricing policy is a matter for BBB to decide. They could elect to maintain the current 50% mark-up on cost and if they did the price of the GC would fall by around 7% in line with the costs. This should make them more competitive in the market.

They could also reduce the prices by a little less than 7% (say 5%) in order to increase internal margins a little.

It is possible that the issue lies elsewhere. If the quality of the work or the reputation and reliability of the builder is questionable then reducing prices is unlikely to improve sales. It is conceivable that BBB has a good reputation for EX but not for GC, but more likely that a poor reputation would affect all products. Equally poor service levels or lack of flexibility in meeting customer needs may be causing the poor sales performance. These too will not be 'corrected' by merely reducing prices.

It is also possible that the way salesmen discuss or sell their products for the GC is not adequate so that in some way customers are being put off placing the work with BBB.

BBB is in competition and it perhaps needs to reflect this in its pricing more (by 'going rate pricing') and not seek to merely add a mark-up to its costs.

BBB could try to penetrate the market by pricing some jobs cheaply to gain a foothold. Once this has been done the completed EX or GC could be used to market the business to new customers.

The price of the EX would also need consideration. There is no indication of problems in the selling of the EX and so BBB could consider pushing up their prices by around 2% in line with the cost increase. On the figures in my answer the price goes up for a typical extension to $31,470 from $30,750 a rise of $720. This does not seem that significant and so might not lose a significant number of sales.

The reliability and reputation of a builder is probably more important than the price that they charge for a job and so it is possible that the success rate on job quotes may not be that price sensitive.

(d) Marginal costs are those costs that are incurred as a consequence of the job being undertaken. In this case they would include only the materials and the labour. If overheads are included then this is known as total absorption costing.

Overheads are for many businesses fixed by nature and hence do not vary as the number of jobs changes. In a traditional sense any attempt to allocate costs to products (by way of labour hours for example) would be arbitrary with little true meaning being added to the end result. The overhead absorption rate (OAR) is merely an average of these costs (over labour hours) and is essentially meaningless. This switch (to marginal costing) would also avoid the problem of the uncertainty of budget volume. Budget volume is needed in order to calculate the fixed cost absorption rate.

The marginal cost (MC) is more understandable by managers and indeed customers and a switch away from total absorption cost (TAC) could have benefits in this way. Clearly if overheads are going to be excluded for the cost allocations then they would still have to be covered by way of a bigger margin added to the costs. In the end all costs have to be paid for and covered by the sales in order to show a profit.

A more modern viewpoint is that activity causes costs to exist. For example, it is the existence of the need for site visits that gives rise to the need for a supervisor and therefore, for his costs. If the activities that drive costs are identified, more costs can then be directly traced to products, hence eradicating the need for arbitrary apportionment of many overhead costs. This has the benefit of all costs being covered, rather than the potential shortfall that can arise if marginal cost plus pricing is used.

In the long run businesses have to cover all costs including fixed overheads in order to make a profit, whichever pricing strategy is adopted.

2 **(a)** The performance of the production director could be looked at considering each decision in turn.

The new wood supplier: The wood was certainly cheaper than the standard saving $5,100 on the standard the concern though might be poor quality. The usage variance shows that the waste levels of wood are worse than standard. It is possible that the lower grade labour could have contributed to the waste level but since both decisions rest with the same person the performance consequences are the same. The overall effect of this is an adverse variance of $2,400, so taking the two variances together it looks like a poor decision. As the new labour is trained it could be that the wood usage improves and so we will have to wait to be sure.

The impact that the new wood might have had on sales cannot be ignored. No one department within a business can be viewed in isolation to another. Sales are down and returns are up. This could easily be due to poor quality wood inputs. If SW operates at the high quality end of the market then sourcing cheaper wood is risky if the quality reduces as a result.

The lower grade of labour used: SW uses traditional manual techniques and this would normally require skilled labour. The labour was certainly paid less, saving the company $43,600 in wages. However, with adverse efficiency and idle time of a total of $54,200 they actually cost the business money overall in the first month. The efficiency variance tells us that it took longer to produce the bats than expected. The new labour was being trained in April 2010 and so it is possible that the situation will improve next month. The learning curve principle would probably apply here and so we could expect the average time per bat to be less in May 2010 than it was in April 2010.

(b) Variance for May 2010:

Material price variance ($196,000/40,000 – 5) x 40,000 = $4,000 Fav

Material usage variance (40,000 – (19,200 x 2)) x $5/kg = $8,000 Adv

Labour rate variance ($694,000/62,000 – 12) x 62,000 = 50,000 Fav

Labour efficiency variance (61,500 – 57,600) x 12 = 46,800 Adv

Labour idle time variance 500 x 12 = 6,000 Adv

Sales price variance (68 – 65) x 18,000 = 54,000 Adv

Sales volume contribution variance (18,000 – 19,000) x 22 = 22,000 Adv

3 **(a)** The optimal production mix can be found by solving the two equations given for F and T.

$7W + 5L = 3{,}500$
$2W + 2L = 1{,}200$

Multiplying the second equation by 2·5 produces:

$7W + 5L = 3{,}500$
$5W + 5L = 3{,}000$

$2W = 500$
$W = 250$

Substituting $W = 250$ in the fabric equation produces:

$2 \times 250 + 2L = 1{,}200$
$2L = 700$
$L = 350$

The optimal solution is when 250 work suits are produced and 350 lounge suits are produced. **The contribution gained is $26,000:**

C = 48W + 40L
C = (48 x 250) + (40 x 350)
C = 26,000

(b) The shadow prices can be found by adding one unit to each constraint in turn.

Shadow price of T

7W + 5L = 3,501
2W + 2L = 1,200

Again multiplying the second equation by 2·5 produces:

7W + 5L = 3,501
5W + 5L = 3,000
2W = 501
W = 250·5

Substituting W = 250·5 in the fabric equation produces:

(2 x 250·5) + 2L = 1,200
2L = 1,200 – 501
L = 349·5

Contribution earned at this point would be = (48 x 250·5) + (40 x 349·5) = 26,004 which is an increase of $4.

Hence the shadow price of T is $4 per hour.

Shadow price of F

7W + 5L = 3,500
2W + 2L = 1,201

Again multiplying the second equation by 2·5 produces:

7W + 5L = 3,500·0
5W + 5L = 3,002·5
2W = 497·5
W = 248·75

Substituting W = 248·75 in the fabric equation produces:

(2 x 248·75) +2L = 1,201
2L = 1,201 – 497·5
L = 351·75

Contribution earned at this point would be = (48 x 248·75) + (40 x 351·75) = 26,010, which is an increase of $10.

Hence the shadow price of F is $10 per metre.

(c) The shadow price represents the maximum *premium* above the normal rate a business should be willing to pay for more of a scarce resource. It is equal to the increased contribution that can be gained from gaining that extra resource.

The shadow price of labour here is $4 per hour. The tailors have offered to work for $4·50 – a premium of $3·00 per hour. At first glance the offer seems to be acceptable.

However, many businesses pay overtime at the rate of time and a half and some negotiation should be possible to create a win/win situation. Equally some consideration should be given to the quality aspect here. If excessive extra hours are worked then tiredness can reduce the quality of the work produced.

(d) If maximum demand for W falls to 200 units, the constraint for W will move left to 200 on the x axis of the graph. The new optimum point will then be at the intersection of:

W = 200 and
2W + 2L = 1,200

Solving these equations simultaneously, if:
W = 200, then (2 x 200) + 2L = 1,200
Therefore L = 400.

So, the new production plan will be to make 400L and 200W

4 **(a)** Price under existing policy

	$
Steel (0·4/0·95 x $4·00)	1·68
Other materials ($3·00 x 0·9 x 0·1)	0·27
Labour (0·25 x $10)	2·50
Variable overhead (0·25 x $15)	3·75
Delivery	0·50
Total variable cost	8·70
Mark-up 30%	2·61
Transfer price	11·31

(b) The only difference would be to add the fixed costs and adjust the mark-up %.

	$
Existing total variable cost	8·70
Extra fixed cost (0·25 x $15 x 0·8)	3·00
Total cost	11·70
Mark-up 10%	1·17
Transfer price	12·87

The price difference is therefore 12·87 – 11·31 = $1·56 per unit

(c) As far as the manufacturer is concerned, including fixed costs in the transfer price will have the advantage of covering all the costs incurred. In theory this should guarantee a profit for the division (assuming the fixed overhead absorption calculations are accurate). In essence the manufacturer is reducing the risk in his division.

The accounting for fixed costs is notoriously difficult with many approaches possible. Including fixed costs in the transfer price invites manipulation of overhead treatment.

One of the main problems with this strategy is that a fixed cost of the business is being turned into a variable cost in the hands of the seller (in our case the stores). This can lead to poor decision-making for the group since, although fixed costs would normally be ignored in a decision (as unavoidable), they would be relevant to the seller because they are part of their variable buy in price.

(d) **Degree of autonomy allowed to the stores in buying policy.**

If the stores are allowed too much freedom in buying policy Hammer could lose control of its business. Brand could be damaged if each store bought a different supplier's shears (or other products). On the other hand, flexibility is increased and profits could be made for the business by entrepreneurial store managers exploiting locally found bargains. However, the current market price for shears may only be temporary (sale or special offer) and therefore not really representative of their true market 'value'. If this is the case, then any long-term decision to allow retail stores to buy shears from external suppliers (rather than from Nail) would be wrong.

The question of comparability is also important. Products are rarely 'identical' and consequently, price differences are to be expected. The stores could buy a slightly inferior product (claiming it is comparable) in the hope of a better margin. This could seriously damage Hammer's brand.

Motivation is also a factor here, however. Individual managers like a little freedom within which to operate. If they are forced to buy what they see as an inferior product (internally) at high prices it is likely to de-motivate. Also with greater autonomy, the performance of the stores will be easier to assess as the store managers will have control over greater elements of their business.

5 (a) Bonus calculation:

	Qtr to 30 June 2009	Qtr to 30 September 2009	Qtr to 31 December 2009	Qtr to 31 March 2010	Bonus; hits'
Staff on time?					
On-time %	430/450 = 95·5%	452/480 = 94·2%	442/470 = 94·0%	460/480 = 95·8%	2
Bonus earned?	Yes	No	No	Yes	
Members visits					
Target visits	60% x 3,000 x 12 = 21,600	60% x 3,200 x 12 = 23,040	60% x 3,300 x 12 = 23,760	60% x 3,400 x 12 = 24,480	
Actual visits	20,000	24,000	26,000	24,000	
Bonus earned?	No	Yes	Yes	No	2

	Qtr to 30 June 2009	Qtr to 30 September 2009	Qtr to 31 December 2009	Qtr to 31 March 2010	Bonus; hits'
Personal training					
Target	10% x 3,000 = 300	10% x 3,200 = 320	10% x 3,300 = 330	10% x 3,400 = 340	
Actual sessions	310	325	310	339	
Bonus earned	Yes	Yes	No	No	2
Total					6

The bonus earned by the manager would be 6 x $400 = $2,400, which is 50% of the total bonus available.

(b) An important principle of any target based bonus system is that the targets must be based on controllable aspects of the manager's role.

Staff on time

The way in which a manager manages staff can have a big bearing on whether or not an individual staff member is keen to work and arrive on time. We are told that the local manager has the power to vary employment contracts so he should be able to agree acceptable shift patterns with staff and reward them for compliance. In this respect the lateness of staff is controllable by the manager.

On the other hand an individual staff member may be subject to home pressures or problems with public or other transport meaning that even they cannot control the time of arrival at work on some days. The manager cannot control these events either. If this problem became regular for a member of staff then the local manager could vary the contract of employment accordingly.

Overall, lateness to work is controllable by the local manager.

Member use of facilities

The local manager controls the staff and hence the level of customer service. Good quality customer services would probably encourage members to use the facilities more often. Equally, by maintaining the club to a high standard then the local manager can remove another potential reason for a member not to use the facilities regularly.

On the other hand customers are influenced by many factors outside of the club. Their state of health or their own work pressures can prevent members being able to come to the club.

Overall, the local manager can only partly control the number of member visits.

Personal training sessions

Again, the local manager controls the level of customer service and the standard of maintenance in the personal training department. He also has control over prices so, if the bookings fall, he is able to reduce price or make special offers to encourage use of the facilities.

On the other hand, personal training sessions may be seen as a luxury by customers and in times of financial difficulty they are expendable by them. Personal training sessions are often available from other sources and competition can force down the sales of the club. The manager can respond to that by improving services. He cannot, however, make significant investment in improving the facilities without board approval.

Overall, the local manager can only partly control the number of personal training sessions booked.

(c) There are a variety of methods that the performance data can be manipulated:

Cut off

The unethical manager could record visits in a different period than was actually the case. For example in quarter three the target for personal training sessions was not met by 20 sessions. This was probably obvious to the manager in the last few days of that quarter. He could have therefore recorded some sessions as having taken place in the next quarter. Indeed, only one session would have to be moved in this way in order for the manager to meet the target in the final quarter and gain another $400 of bonus.

Reduce prices to below economic levels to encourage use
The targets that the manager is subject to are mainly volume driven. A reduction in prices would harm profitability but would not damage the manager's bonus potential. More sessions are bound to follow if the price is set low enough.

(Other ideas would be acceptable including advising staff to take the day off if they were going to be late. This would damage service levels admittedly, but would potentially gain a bonus for lateness.)

			Marks	*Marks*
1	**(a)**	Materials	1	
		Labour	1	
		OAR	1	
		Overhead costs per unit	1	
		Price	1	
		Total		5
	(b)	Materials	0·5	
		Labour	0·5	
		Overheads per unit per category (3 categories) – 1 mark each	3	
		Price	1	
		Total		5
	(c)	GC reduce price by 7%	1	
		GC reduce by < 7%	1	
		Quality, reputation, reliability, sales documentation quality	2	
		EX increase price by 2%	1	
		EX hold price	1	
		Total		6
	(d)	MC and TAC definitions	1	
		FC explanation of issue	2	
		Margin increase needed	1	
		Total		4
		Total		**20**
2	**(a)**	Assessment of wood decision	2·5	
		Assessment of labour decision	2·5	
		Sales consequences	2	
		Total		7
	(b)	MPV	2	
		MUV	2	
		LRV	2	
		LEV	2	
		LIT	1	
		SPV	2	
		SVCV	2	
				13
		Total		**20**
3	**(a)**	Optimal point calculation	3	
		Contribution	1	
				4
	(b)	For each shadow price	3	
				6
	(c)	Rate discussion	3	
		Other factors e.g. tiredness, negotiation	3	
				6
	(d)	Find optimum point	1	
		Solve 2 equations	2	
		Conclusion	1	
				4
		Total		**20**

			Marks	*Marks*
4	**(a)**	Steel	1	
		Other material	1	
		Labour	1	
		Variable overhead	1	
		Delivery	1	
		Mark-up	1	
		Total		6
	(b)	Fixed cost	2	
		Mark-up	2	
		Total		4
	(c)	Covers all cost	1	
		Risk	1	
		Fixed cost accounting	1	
		Converts a FC to VC	2	
		Total (max)		4
	(d)	Market price may be temporary	1	
		Brand	1	
		Profitability	1	
		Flexibility	1	
		Control	1	
		Motivation	1	
		Performance assessment	1	
		Comparability	1	
		Total (max)		6
		Total		**20**
5	**(a)**	Per target	2	
		Total		6
	(b)	For each target – supporting controllability	1·5	
		For each target – denying controllability	1·5	
		Target		9
	(c)	For each idea of manipulation up to	2·5	
				5
		Total		**20**