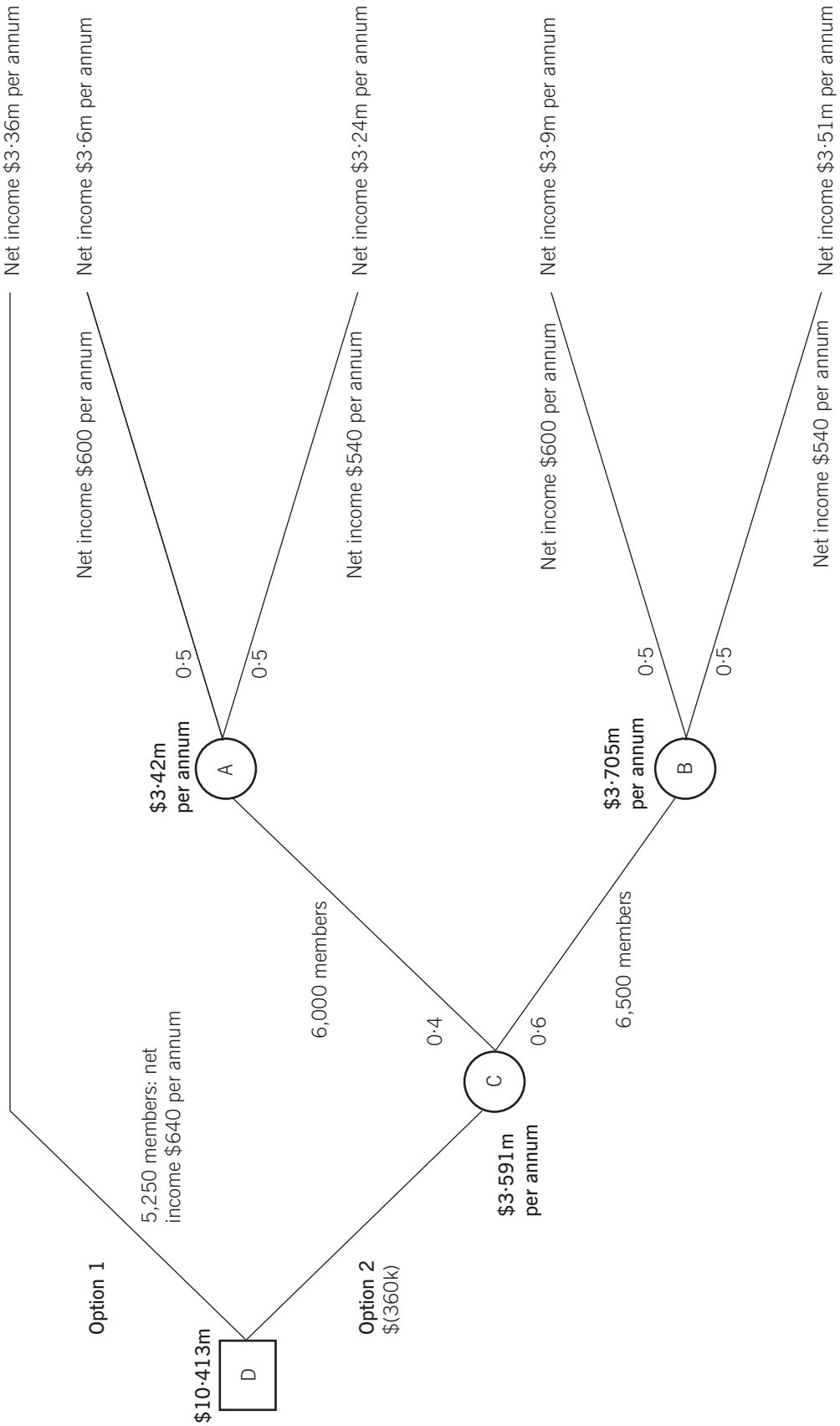
Answers

1 (a) Decision tree



Workings

Option 1
Net income = $720 – $80 = $640 per annum.

Option 2
If costs $120 per annum, net income = $720 – $120 = $600 per annum.
If costs $180 per annum, net income = $720 – $180 = $540 per annum.

Expected value and decision:

EV at A = (0·5 x $3·6m) + (0·5 x $3·24m) = $3·42m
EV at B = (0·5 x $(3·9m) + (0·5 x $3·51m) = $3·705m
EV at C = (0·4 x $3·42m) + (0·6 x $3·705m) = $3·591m per annum

At D, compare EV of:
Option 1: (3 x $3·36m) = **$10·08m**
Option 2: ($3 x $3·591m) – $360k = **$10·413m**

Therefore choose option 2 – expand exercise studio.

(b) **With perfect information:**

If membership numbers were 6,000:
EV = $3·42m x 3 = $10·26m
Less costs of $360k = **$9.9m**

Therefore, with these membership numbers, GB would choose option 1 instead.

If membership numbers were 6,500:
EV = $3·705 x 3 = $11·115m
Less costs of $360k = **$10·755m**

In this instance, GB would choose option 2.

So, if membership numbers are 6,000, of which there is a 0·4 probability, EV will be $10·08m (option 1) and if membership numbers are 6,500, of which there is a 0·6 probability, then EV will be $10·755m (option 2).

Therefore EV with perfect information = (0·4 x $10·08m) + (0·6 x $10·755) = $10·485m.

Without perfect information the EV is $10·413m, therefore the value of it is $72k ($10·485m – $10·413m). This represents the maximum price that GB should be prepared to pay for the information.

(c) The expansion decision is a one-off decision, rather than a decision that will be repeated many times. Expected values, on the other hand, give us a long run average of the outcome that would be expected if a decision was to be repeated many times. The actual outcome may not be very close to the expected value calculated and the technique is therefore not really very useful here.

Also, estimating accurate probabilities is difficult because this exact situation has not arisen before.

The expected value criterion for decision-making is useful where the attitude of the investor is risk neutral. We do not know what the management of Gym Bunnies' attitude to risk is, which makes it difficult to say whether this criterion is a good one to use. In a decision such as this one, it would be useful to see what the worst case scenario and best case scenario results would be too, in order to assist decision-making.

2 (a) Goals and measures

Goals	Performance Measures	Reason
Financial perspective		
Increase revenue	Percentage increase in total revenue	The changes have been implemented partly in an attempt to increase revenues, so it is sensible to measure the extent to which revenues have actually increased.
Increase operating profit margin	Percentage increase in operating profit	The changes have been implemented partly in an attempt to increase operating profit, so it is sensible to measure the extent to which operating profit has actually increased.
Customer perspective		
Increase customer acquisition	Total sales to new customers	The fourth change (to standalone products) was made in an attempt to attract new customers. This measure will help to assess whether the change has been successful.
Reduce loss of customers	Customer churn rate	The first three of the four changes made were made in an attempt to retain customers. This performance measure will help to assess whether the changes have been successful.
Internal business perspective		
Reduce number of broadband contracts cancelled	Number of broadband contracts cancelled	This performance measure will enable Squarize to assess whether the improved broadband service has resulted in a reduction of the number of contracts cancelled.
Increase after sales service quality	Percentage of customer requests that are handled with a single call	Squarize transferred its call centre back to its home country. This measure will assess whether that has improved the service quality to customers as a result.
Learning and growth perspective		
Increase call centre workers' skill levels	Number of training hours per employee	This measure will improve the likelihood of customers receiving an improved service. A better public image should result, leading to increased revenues as new customers are attracted to the business.
Increase employees' satisfaction	Percentage decrease in staff turnover	This measure will also help to improve customer service, thereby improving company image, attracting new customers and increasing revenues in the long term.

(Other reasonable suggestions will be equally acceptable)

(b) Pay-tv customers currently own the boxes, meaning that a certain number of customers appear to cancel their contract after the first three months and just keep the set-top box with its free channels. Squarize may want to consider loaning the boxes rather than selling them to the customers at the beginning of the contract.

The company only has a minimum contract period of three months. This seems very short and perhaps the company could consider increasing it to 12 months. Unnecessary administration costs must be arising because it takes time, and therefore money, to set up new customers. If these customers then leave three months later, the company has not had much opportunity to earn profits from the customers generating these costs.

3 (a) Revised target cost

	$	$
Manufacturing cost		
Direct material (working 1)	21·60	
Direct labour (working 2)	10·96	
Machine costs	21	
Quality control costs	10	
Rework costs (working 3)	1·80	
		65·36
Product development cost	25	
Marketing cost	35	
Non-manufacturing costs		60
Total cost		125·36

Working 1: Direct material cost
Parts to be replaced by standard parts = $40 x 0·8 = $32.
New cost of those at 45% (100% – 55%) = $14·40.
Unique irreplaceable parts: original cost = $40 x 20% = $8.
New cost $7·20
Revised direct material cost = $14·40 + $7·20 = $21·60

Working 2: Direct labour
Direct labour – cost per unit for first one hundred units:
$Y = ax^b$
$45 \times 100^{-0·152} = 22·346654$ minutes
Total time for 100 units = 2,234·6654 minutes.

Time for the 100th unit:
Time for 99 units = $45 \times 99^{-0·152}$
= 22·380818 minutes.
For 99 units = 2,215·701 minutes.
Therefore, time for 100th unit = 2,234·6654 – 2,215·701 = 18·9644 minutes.

Time for remaining 49,900 units = 946,323·56 minutes.
Total labour time for 50,000 units = 948,558·23 minutes.
Therefore total labour cost = 948,558·23/60 x $34·67 = $548,108·56.
Therefore average labour cost per unit = $548,108·56/50,000 = $10·96.

Note: *Some rounding is acceptable and marks would still be given.*

Working 3: Rework cost
Total cost = 50,000 x 10% x $18 = $90,000.
Cost per average unit = $90,000/50,000 = $1·80.

(b) Market skimming

Market skimming is a strategy that attempts to exploit those areas of the market which are relatively insensitive to price changes. Initially, high prices for the webcam would be charged in order to take advantage of those buyers who want to buy it as soon as possible, and are prepared to pay high prices in order to do so.

The existence of certain conditions is likely to make the strategy a suitable one for Cam Co. These are as follows:

- Where a product is new and different, so that customers are prepared to pay high prices in order to gain the perceived status of owning the product early. The webcam has superior audio sound and visual quality, which does make it different from other webcams on the market.
- Where products have a short life cycle this strategy is more likely to be used, because of the need to recover development costs and make a profit quickly. The webcam does only have a two year life cycle, which does make it rather short.
- Where high prices in the early stages of a product's life cycle are expected to generate high initial cash inflows. If this were to be the case for the webcam, it would be particularly useful for Cam Co because of the current liquidity problems the company is suffering. Similarly, skimming is useful to cover high initial development costs, which have been incurred by Cam Co.
- Where barriers to entry exist, which deter other competitors from entering the market; as otherwise, they will be enticed by the high prices being charged. These might include prohibitively high investment costs, patent protection or unusually strong brand loyalty. It is not clear from the information whether this is the case for Cam Co.
- Where demand and sensitivity of demand to price are unknown. In Cam Co's case, market research has been carried out to establish a price based on the customers' perceived value of the product. The suggestion therefore is that some information is available about price and demand, although it is not clear how much information is available.

It is not possible to say for definite whether this pricing strategy would be suitable for Cam Co, because of the limited information available. However, it does seem unusual that a high-tech, cutting edge product like this should be sold at the same price over its entire, short life cycle. Therefore, price skimming should be investigated further, presuming that this has not already been done by Cam Co.

4 (a) **Sales price operational variance:** (actual price – market price) x actual quantity

Commodity 3: ($40·40 – $39·10) x 25,600 = $33,280F

Sales price planning variance: (standard price – market price) x actual quantity

Commodity 3: ($41·60 – $39·10) x 25,600 = $(64,000)A

An alternative approach to the variance calculations for Commodity 3 would be as follows:

Sales price operational variance

	Commodity 3
Should now	$39·10
Did	$40·40
Difference	$1·30F
Actual sales quantity	25,600
Variance	$33,280F

Sales price planning variance

	Commodity 3
Should now	$39·10
Should	$41·60
Difference	$2·50A
Actual sales quantity	25,600
Variance	$64,000A

(b) **Sales mix variance:**

(Actual sales quantity in actual mix at standard margin) – (actual sales quantity in standard mix at standard margin) = $768,640 (w.1 & 2) – $782,006 (w.3) = $13,366 adverse.

Working 1: Standard margins per unit:
Budgeted machine hours = (30,000 x 0·2) + (28,000 x 0·6) + (26,000 x 0·8) = 43,600.
Overhead absorption rate = $174,400/43,600 = $4 per hour.

Product	Commodity 1 $	Commodity 2 $	Commodity 3 $
Standard selling price	30	35	41·60
Variable production costs	(18)	(28·40)	(26·40)
Fixed production overheads	(0·8)	(2·4)	(3·2)
Standard profit margin	11·20	4·20	12

Working 2: Actual sales quantity in actual mix at standard profit margin:

Product	Actual quantity in actual mix	Standard profit	$
Commodity 1	29,800	$11·20	333,760
Commodity 2	30,400	$4·20	127,680
Commodity 3	25,600	$12	307,200
	85,800		768,640

Working 3 Actual sales quantity in standard mix at standard profit margin:

Product	Actual quantity in standard mix	Standard profit	$
Commodity 1	85,800 x 30/84 = 30,643	$11·20	343,202
Commodity 2	85,800 x 28/84 = 28,600	$4·20	120,120
Commodity 3	85,800 x 26/84 = 26,557	$12	318,684
	85,800		782,006

The sales quantity variance = (actual sales quantity in standard mix at standard margin) – (budgeted sales quantity in standard mix at standard profit margin) = $782,006 (w.3 above) – $765,600 (w.4) = $16,406 favourable.

Working 4: Budgeted sales quantity in standard mix at standard profit margin:

Product	Quantity	Standard profit	$
Commodity 1	30,000	$11·20	336,000
Commodity 2	28,000	$4·20	117,600
Commodity 3	26,000	$12	312,000
	84,000		765,600

(c) The calculations above have shown that, as regards the sales price, there is a $23,360 favourable operational variance and a $54,680 adverse planning variance. In total, these net off to a sales price variance of $31,320 adverse. The sales manager can only be responsible for a variance to the extent that he controls it. Since the standard selling prices are set by a consultant, rather than the sales manager, the sales manager can only be held responsible for the operational variance. Given that this was a favourable variance of $23,360, it appears that he has performed well, achieving sales prices which, on average, were higher than the market prices at the time. The consultant's predictions, however, were rather inaccurate, and it is these that have caused an adverse variance to occur overall in relation to sales price.

As regards sales volumes, the mix variance is $13,366 adverse and the quantity variance is $16,406 favourable, meaning that the total volume variance is $3,040 favourable. This is because total sales volumes were higher than expected, although it is apparent that the increased sales related to the lower margin Commodity 2, with sales of Commodity 1 and Commodity 3 actually being lower than budget.

The total variance relating to sales is $28,280 adverse. This looks poor but, as identified above, it is due to the inaccuracy of the sales price forecasts made by the consultant. We know that Block Co is facing tough market conditions because of the economic recession and therefore it is not that surprising that market prices were actually a bit lower than originally anticipated. This could be due to the recession hitting even harder in this quarter than in previous ones.

5 (a) Budget deficit/surplus

Budgeted income:
Income from pupils registered on 1 June 2013: $724,500 (given in question)
Expected number of new joiners: (0·2 x 50) + (0·3 x 20) + (0·5 x 26) = 29
Expected income from new joiners at $900 each = $26,100
Total expected income = $750,600.

Budgeted expenditure:
Repairs and maintenance: $30,000 x 1·03 = $30,900.
Salaries: [($620,000 – $26,000)/2] + [($620,000 – $26,000 x 1·02)/2]
= $297,000 + $302,940 = $599,940.
Expected capital expenditure = (0·7 x $145,000) + (0·3 x $80,000) = $125,500.
Total expected expenditure = $756,340.

Budget deficit = $5,740.

(b) Discussion of estimates

Advantages

- Incremental budgeting is very easy to perform. This makes it possible for a person without any accounting training to build a budget.
- Incremental budgeting is also very quick compared to other budgeting methods.
- The information required to complete it is also usually readily available.

Disadvantages

- On the other hand, incremental budgeting encourages inefficiency because it does not question the preceding year's figures on which it is based. No-one asks how those figures could be reduced.
- Similarly, in some organisations, it encourages slack because departmental managers may attempt to use their entire budget up for one year, even if they do not need to, just to ensure that that cash is available again the next year.
- Errors from one year are carried to the next, since the previous year's figures are not questioned.

(c) Zero-based budgeting (ZBB)

The three main steps involved in preparing a zero-based budget are as follows:

1. Activities are identified by managers. Managers are then forced to consider different ways of performing the activities. These activities are then described in what is called a 'decision package', which:
   - analyses the cost of the activity;
   - states its purpose;
   - identifies alternative methods of achieving the same purpose;

- establishes performance measures for the activity;
- assesses the consequence of not performing the activity at all or of performing it at different levels.

As regards this last point, the decision package may be prepared at the base level, representing the minimum level of service or support needed to achieve the organisation's objectives. Further incremental packages may then be prepared to reflect a higher level of service or support.

2. Management will then rank all the packages in the order of decreasing benefits to the organisation. This will help management decide what to spend and where to spend it. This ranking of the decision packages happens at numerous levels of the organisation.

3. The resources are then allocated, based on order of priority up to the spending level.

(d) Use of ZBB at Newtown School

There is definitely a place for ZBB at Newtown School. At the moment, incremental budgeting is responsible for recurring unexpected cash shortages, which is deterring new pupils from joining the school. Had a deficit been predicted for the year ended 31 May 2013, perhaps $65,000 would not have been spent on improving the school gym, and then it would not have been necessary to close the school kitchen. ZBB would be good to establish the way cash is spent on those activities that are, to a certain extent, discretionary.

For example, although there is a need for pupils to have somewhere to eat lunch, it is not essential for children to have a cooked meal every day. It is essential that children do have somewhere to eat though and, as a bare minimum, they would need an area where they could eat their sandwiches and have access to fresh water. ZBB could be used to put together decision packages which reflect the different levels of service available to the children. For example, the most basic level of service could be the provision of an area for the children to eat a lunch brought from home. The next level would be the provision of some cold and maybe hot food for the children, but on a self-service basis. Finally, the highest level of service would be a restaurant for the children where they get served hot meals at tables. At Newtown School the catering manager could prepare the decision packages and they would then be decided upon by the head teacher, who would rank them accordingly.

Similarly, although some level of sports education is needed, the extent of the different activities offered is discretionary. ZBB could be used to create decision packages for each of these services in order to prioritise them better than they are currently being prioritised.

ZBB takes a long time to implement and would not be appropriate to all categories of expenditure at the school. Much of the budgeting is very straight forward. Incremental budgeting could still be used as a starting point for essential expenditure such as salary costs, provided that changes in staff numbers are also taken into account. There is an element of essential, recurring expenditure in relation to repairs and maintenance too, since the costs of the checks and repairs needed to comply with health and safety standards seem to largely stay the same each year, with an inflationary increase.

			Marks
1	**(a)**	Decision tree diagram	
		Start with decision point	0·5
		Option 1 format	0·5
		Option 2 format	5
		Expected value and decision	
		EV at A	1
		EV at B	1
		EV at C	2
		Compare EVs at D	1
		Recommendation that follows	1
			12
	(b)	Price of perfect information	
		EV with 6,000 members	2
		EV with 6,500 members	2
		Price	2
			6
	(c)	Discussion	2
		Total marks	**20**
2	**(a)**	Balanced scorecard	
		Identifying the four perspectives	2
		Each goal	0·5
		Each performance measure	0·5
		Each reason	1
		Maximum marks	16
	(b)	Customer retention issue	
		Each point discussed – 2 marks	4
		Maximum marks	4
		Total marks	**20**

			Marks
3	**(a)**	Revised lifetime cost	
		Direct material cost	2·5
		Direct skilled labour cost:	
		Cumulative average time per unit for 100 units	1
		Cumulative total time for 100 units	0·5
		Cumulative average time per unit for 99 units	1
		Cumulative total time for 99 units	0·5
		Incremental time for 100th unit	1
		Total time for 49,900 units	0·5
		Total time for 50,000 units	0·5
		Total labour cost for 50,000 units	0·5
		Average labour cost per unit	0·5
		Machine costs	0·5
		Quality control costs	0·5
		Rework cost	1
		Non-manufacturing cost	1
		Total cost	0·5
			12
	(b)	Market skimming	
		Explanation – maximum	2
		Discussion of each condition – maximum	2
		Conclusion	1
		Maximum marks	8
		Total marks	**20**
4	**(a)**	Planning and operational variances	
		Operational variance	2
		Planning variance	2
			4
	(b)	Mix and quantity variances	
		Standard profit per unit	4
		Mix variance	4
		Quantity variance	3
			11
	(c)	Discussion	
		Each valid comment	1
			5
		Total marks	**20**

			Marks
5	**(a)**	Budgeted income	2
		Repairs and maintenance	1
		Teachers' salaries	1·5
		Capital expenditure	1
		Deficit	0·5
			6
	(b)	Advantages and Disadvantages	
		Two advantages	2
		Two disadvantages	2
			4
	(c)	Zero-based budgeting	
		Step 1	2
		Step 2	2
		Step 3	2
			6
	(d)	Use of ZBB to Newtown School	
		Each point made	1
		Maximum	4
		Total marks	**20**