

Math 1010: Practice Questions for Unit #4

To help you prepare for Test #4, complete these practice questions. These questions are similar to those you will see on the test. Complete them as you would on a test, that is, show your work.

1. A neighbourhood pub proposal outlines the following information:
 - The average customer spends \$15 on food and drinks.
 - Fixed costs are \$10,000 per month.
 - Food and drinks are priced at 3 times their cost.
 - Capacity is estimated at 50 customers per day. Assume 24 business days per month.
 - a. Calculate the break-even point i) in units ii) in dollars and iii) as a percent of capacity.
 - b. Determine the net income at a sales volume of i) 1,200 customers ii) \$9,750
 - c. Determine the level of operations as a percent of capacity to generate a net income of \$1,250.
 - d. Determine the level of operations in dollars to sustain a loss of no more than \$1,500.
 - e. Determine the break-even point in dollars if fixed costs are reduced by 20%.
 - f. Determine the break-even point in dollars if fixed costs are reduced to \$7,500 and the food and drinks are priced at 5 times their cost.
2. Sunshine Tours offers tours for \$1,000 each. It can provide a maximum of 1,000 tours per year. The variable costs for each tour are \$300 for meals and accommodation, \$150 for taxi transfers and \$200 in other miscellaneous activities. The fixed overhead costs for the company are \$210,000 per year.
 - a. Use algebra to calculate the break-even point in volume and in sales.
 - b. What is the break-even as a percent of the capacity?
3. Choco Corp. manufactures boxes of chocolate candies. Its basic cost and profit information is summarized below:
 - Selling price (per box): \$8.00
 - Variable cost (per box): \$2.00
 - Fixed cost (total per month): \$24,000The company has the capacity to manufacture up to 10,000 boxes of its candy per month.
 - a. What is the break-even point in terms of number of units and in dollars of sales?
 - b. What is the necessary sales volume (in number of units and in sales dollars) for Choco Corp. to earn \$12,000 in net income?
 - c. What is the necessary sales volume (in number of units and in sales dollars) for the company to earn a profit equal to 20 percent of its revenues?

- d. The primary material used to produce the candy is obtained from a foreign supplier. War in the region has created problems with shipping the product to Choco, and as a result, materials cost is expected to increase. The impact is that the materials cost will increase by \$0.80 per box of candy produced. How many additional units must the company sell in order to break even?
4. A firm manufactures a product that sells for \$12 per unit. Variable cost per unit is \$8 and fixed cost per period is \$1,200. Capacity per period is 1,000 units.
 - a. Write algebraic statements of the revenue function and the cost function.
 - b. Compute the break-even point in units, as a percent of capacity and in sales dollars.
 5. Engineering estimates indicate the variable cost of manufacturing a new product will be \$35 per unit. Based on market research, the selling price of the product is to be \$120 per unit and variable selling expense is expected to be \$15 per unit. The fixed costs applicable to the new product are estimated to be \$2,800 per period and capacity per period is 100 units.
 - a. Write algebraic statements of the revenue function and the cost function.
 - b. Compute the break-even point in units, as a percent of capacity and in sales dollars.
 - c. Determine the net income at a volume of 70 units.
 - d. Determine the net income at a volume of 30% of capacity.
 - e. Determine the net income at a sales volume of \$10,200.
 - f. Determine the level of operations as a percentage of capacity to generate a net income of \$2,240.
 - g. Determine the number of units that must be sold to make a net income of \$1,050.
 - h. Determine the sales volume in dollars to suffer a loss of no more than \$350.
 - i. Determine the break-even point in units if fixed costs are increased to \$3,150.
 - j. Determine the break-even point as a percentage of capacity if fixed costs are reduced by \$160 and the variable cost of manufacturing is increased to \$39 per unit.
 - k. Determine the break-even point in dollars if the selling price is reduced to \$100 per unit.
 6. The lighting division of Universal Electric Company plans to introduce a new streetlight based on the following accounting information.
 - Fixed costs per period are \$3,136
 - Variable cost per unit is \$157
 - Selling price per unit is \$185
 - Capacity per period is 320 units
 - a. Write algebraic statements of the revenue function and the cost function
 - b. Compute the break-even point in units, as a percentage of capacity and in dollars.
 - c. Determine the net income at a sales volume of
 - i) 25% of capacity
 - ii) \$24,975
 - d. Determine the level of operations as a percentage of capacity to generate a net income of:
 - i) \$2,240
 - ii) \$6,720

- e. Determine the break-even point as a percentage of capacity
 - i) if fixed costs are reduced to \$2,688
 - ii) if fixed costs increase to \$4,588 and variable costs are reduced to 80% of the selling price
 - iii) if the selling price is reduced to \$171
7. A manufacturer of major appliances provides the following information about the operations of the refrigeration division.
- Fixed costs per period are \$26,880
 - Variable costs per unit are \$360
 - Selling price per unit is \$640
 - Capacity is 150 units.
- a. Write algebraic statements of the revenue function and the cost function.
 - b. Compute the break-even point in units, as a percentage of capacity and in dollars.
 - c. Determine the net income at a sales volume of
 - i) \$78,080
 - ii) 48% of capacity
 - d. Determine the volume of output as a percentage of capacity to generate a net income of \$4,200.
 - e. Determine the break-even point in dollars if fixed costs are increased to \$32,200.
 - f. Determine the break-even point as a percentage of capacity if fixed costs are reduced to \$23,808 while variable costs are increased to 60% of sales.
8. The Superior CD Company sells CDs for \$10 each. Manufacturing cost is \$2.60 per CD; marketing costs are \$2.40 per CD and royalty payments are 20% of the selling price. The fixed cost of preparing the CDs is \$18,000. Capacity is 15,000 CDs.
- a. Write algebraic statements of the revenue function and the cost function.
 - b. Compute the break-even point in units, as a percentage of capacity and in dollars.
 - c. Determine the net income at a sales volume of 55% of capacity.
 - d. Determine the sales volume in dollars to generate a net income of \$13,800.
 - e. Determine the break-even point in units if fixed costs are increased by \$1,600 while manufacturing cost is reduced by \$0.50 per CD.
 - f. Determine the break-even point in units if the selling price is increased by 10% while fixed costs are increased by \$2,900.
9. For each of the following, perform a break-even analysis showing:
- algebraic statements of the revenue function and the cost function
 - computation of the break-even point in sales dollars and as a percent of capacity
- a) The following data pertains to the operating budget of Matt Manufacturing

Sales		\$720,000
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Fixed Costs	\$220,000	
Total Variable Costs	324,000	544,000
Net Income		\$176,000

Capacity is a sales volume of \$800,000 per period.

- b) A company has compiled the following estimates regarding operations:

Sales		\$120,000
Fixed Costs	\$43,200	
Total Variable Costs	48,000	91,200
Net Income		\$28,800

Capacity is a sales volume of \$150,000.

10. For question 9a) determine:

- the net income at 85% of capacity;
- the net income at 30% of capacity;
- the level of operations as a percentage of capacity to realize a net income of \$66,000;
- the level of operations in dollars to sustain a loss of no more than \$6,600;
- the break-even point in dollars if fixed costs are increased by 15%; and
- the break-even point as a percentage of capacity if fixed costs are decreased by \$18,400 and variable costs are increased to 52% of sales.

11. The following information is available from the accounting records of Eva Corporation:

- Fixed costs per period are \$4,800
 - Sales volume for the last period was \$19,360
 - Variable costs were \$13,552
 - Capacity per period is a sales volume of \$32,000.
- Write algebraic statements of the revenue function and the cost function.
 - Compute the break-even point in dollars and as a percentage of capacity.
 - Determine the net income at a sales volume of
 - \$24,000
 - 30% of capacity
 - Determine the level of operations as a percentage of capacity to generate a net income of \$3,264
 - Determine the break-even point as a percentage of capacity.
 - if fixed costs are decreased by \$600
 - if fixed costs are increased to \$5,670 and variable costs are changed to 55% of sales

12. The operating budget of Bea Company contains the following information:

Sales at 80% capacity		\$400,000
Fixed Costs	\$105,000	
Variable Costs	260,000	365,000
Net Income		\$35,000

- Compute the break-even point as a percentage of capacity and in dollars.
- Determine the net income at 40% of capacity
- Determine the sales volume as a percentage of capacity to generate a net income of \$61,250
- Determine the break-even point in dollars if fixed costs are reduced by \$11,200 while variable costs are changed to 72% of sales

13. The management of Lambda Corporation has received the following forecast for next year:

Sales Revenue		\$600,000
Fixed Costs	\$275,000	
Variable Costs	270,000	545,000
Net Income		\$55,000

Capacity is a sales volume of \$800,000

- Compute the break-even point in dollars and as a percentage of capacity
- Determine the net income at 50% of capacity
- Determine the sales volume in dollars to generate a net income of \$82,500
- Determine the break-even volume in dollars if fixed costs are increased by \$40,000 while variable costs are held to 40% of sales

14. Alpha Corp. expects to operate at 80% capacity next year. Its forecast operating budget is:

Sales Revenue		\$1,200,000
Fixed Costs	\$300,000	
Variable Costs	800,000	
Total Costs		1,100,000
Net Income		\$100,000

- What is Alpha's break-even Revenue?
- What would be Alpha's net income if it operates at full capacity?