MKT100 - Metrics Mastery Worksheets

Metrics Mastery Worksheets are designed to be in class exercises that your students can work on in class. This is a master document that provides all worksheets questions and answers. You can modify or change it as needed in order to prepare one page two sided exercises for your students to hand out in class. You can also easily turn the answers into powerpoint slides to review the answers in class.

Table of Contents

MKT100 - Metrics Mastery Worksheets

Worksheet: Metric 1 Expense Types

1) The Comfy Chair Company makes reclining chairs at its plant and sells them exclusively through its own retail store. It has the following expenses:
   Plant rent and taxes = $12,000.00
   Office and management expenses = $220,000.00
   Machinery and equipment purchased = $100,000.00
   Direct materials = $27.00/chair
   Direct labour = 4 hours/chair @ $14.00/hour
   Transportation = $5.00/chair
   Commercial store front unit purchase = $500,000.00
   Advertising costs = $100,000.00
   Sales staff wages before commissions = $250,000.00
   Commission = $12.00/chair
   (a) Identify the Comfy Chair Company's variable costs.
   (b) What is the total cost to produce and sell each reclining chair?
   (c) Identify the Comfy Chair Company's fixed costs.
   (d) What are the total fixed costs?
   (e) Identify the one-time fixed costs incurred by the Comfy Chair Company.
   (f) What are the total one-time fixed costs?

   Answer:
   (a) Direct materials = $27.00/chair
   Direct labour = 4 hours/chair @ $14.00/hour
   Transportation = $5.00/chair
   Commission = $12.00/chair
   (b) $100.00/chair
   (c) Plant rent and taxes = $12,000.00
   Office and management expenses = $220,000.00
   Advertising costs = $100,000.00
   Sales staff wages = $250,000.00
   (d) $582,000.00
   (e) Machinery and equipment purchased = $100,000.00
   Commercial store front unit = $500,000.00
   (f) $600,000.00

2) Thompson Toiletries, Inc. has developed an addition to its mens' cologne line tentatively branded Ode d'Toad Cologne. It costs 45 cents to produce each 60mL bottle, and heavy advertising expenditures in the first year would cost $900,000. Ode d'Toad Cologne is priced at $7.50 for a 60mL bottle.
   (a) What is the variable cost per unit to produce a bottle of Ode d'Toad?
   (b) What are the total fixed costs to produce and sell Ode d'Toad?

   Answer:

(a) Variable cost per unit = $0.45
(b) Total fixed costs = $900,000

3) Executives of Radical Recordings Ltd. produced an album entitled Sunshine/Moonshine by the Starshine Sisters Band. The cost and price information was as follows:

Album cover	$1.00
Songwriter's royalties	$0.30
Recording artist's royalties	$0.70
Direct material and labour costs to produce each album	$1.00
Cost of producing the album (studio fee, advertising, promotional expenses, etc)	$100,000.00
Selling price	$7.00

(a) Identify the variable costs, and amounts, that go into producing each album
(b) Identify the fixed costs, and amount, for producing the album

Answer:

(a) Variable costs:

Album cover		$1.00
Songwriter's royalties	$0.30	
Recording artist's royalties		$0.70
Direct material and labout		$1.00
Total Variable Cost per Unit		**$3.00**

(b) Fixed costs:

Cost of producing the album = **Total Fixed Costs = $100,000.00**

4) You are the owner of a travel agency that sells trips to university students. You are creating a package to sell an overnight trip to Blue Mountain. Identify the fixed and variable costs associated with the package based on the information below. After identifying the costs, calculate the total cost based on 3 full busses of students.

The package will include ski lift tickets, access to a VIP party and one night's hotel accommodation. It will cost you $300 to print 1,000 full colour posters and another $400 to purchase party supplies for the VIP Party. Each room costs $80 per night, with four people per room. A bus holds 40 people and the bus company will charge you $500 per bus. The ski hill is offering you a rate of $20 per ski lift pass. You also know that you need to purchase a ¼ page ad in the campus paper at a cost of $100 per week for 6 weeks.

Variable Costs (description & Unit Cost)	**Total**	**Fixed Costs (Description)**	**Total**

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Busses ($500/bus) Hotel Rooms ($80/room) Ski lift passes ($20/pass)	$1500 $2400 $2400	Posters Party Supplies Newspaper ad ($100/wk)	$300 $400 $600
Total Variable Costs	$6300	**Total Fixed Costs**	$1300

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Worksheet: Metric 2 Percentage Change

1) Ed's is a small deli, which has had great success in its second year of operation. Revenues in Year 2 are $570,000, compared with $380,000 in Year 1. What is Ed's year-over-year sales growth rate?

Answer:
Year-over-Year Sales Growth = (Year 2 – Year 1) / Year 1 * 100%
= ($570,000 - $380,000) / $380,000 * 100%
= 50%

2) A pair of jeans that normally sells for $75 is marked down 30% and then reduced at the cash register another 10%? Is this a total reduction of 40%? If not, what is the percent reduction?

Answer:
Let Price 1 be the initial price of $75, let Price 2 be the price after the 30% mark down, and Price 3 be the price after additional 10% reduction at the cash register.
Initial Reduction = -30% = (Price 2 – Price 1) / Price 1
-0.3 = (Price 2 - $75) / $75
-0.3 * $75 = Price 2 - $75
Price 2 = -0.3 * $75 + $75
= $52.50
Second Reduction = -10% = (Price 3 – Price 2) / Price 2
-0.1 = (Price 3 - $52.50) / $52.50
-0.1 * $52.50 = Price 3 - $52.50
Price 3 = -0.1 * $52.50 + $52.50
= $47.25
Total Percent Reduction = (Price 3 – Price 1) / Price 1 * 100%
= ($47.25 - $75) / $75 * 100%
= 37%

3) A small retain chain posts impressive percentage growth figures, moving from $58 million to $107 million in sales from one year to the next. Despite this dynamic growth, however, analysts cast doubt on the firm's business model, warning that its existing stores' growth measure suggests that its concept is failing. Based on the chart below, and assuming that stores were opened on the first day of Years 1 and 2: What is the retail chain's year-over-year sales growth rate? What is the year-over-year sales growth or decrease for each store, as appropriate? What is the same store (existing and not expansion) year-over-year growth?

Store	Opened	Revenue Year 1 (millions)	Revenue Year 2 (millions)

A	Year 1	$10	$9
B	Year 1	$19	$20
C	Year 1	$20	$15
D	Year 1	$9	$11
E	Year 2	n/a	$15
F	Year 2	n/a	$12
G	Year 2	n/a	$7
H	Year 2	n/a	$18
		$58	**$107**

Answer:

Chain-wide Year-over-Year Sales Growth = (Year 2 – Year 1) / Year 1 * 100%
= ($107 - $58) / $58
= 84.5%

Store A Year-over-Year Sales = (Year 2 – Year 1) / Year 1 * 100%
= ($9 - $10) / $10
= -10%

Store B Year-over-Year Sales = (Year 2 – Year 1) / Year 1 * 100%
= ($20 - $19) / $19
= 5.26%

Store C Year-over-Year Sales = (Year 2 – Year 1) / Year 1 * 100%
= ($15 - $20) / $20
= -25%

Store D Year-over-Year Sales = (Year 2 – Year 1) / Year 1 * 100%
= ($11 - $9) / $9
= 22.22%

Same Store Sales Year 1 = $10 + $19 + $20 + $9
= $58 million
Same Store Sales Year 2 = $9 + $20 + $15 + $11
= $55 million
Same Store Year-over-Year Growth = (Year 2 – Year 1) / Year 1 * 100%
= ($55 - $58) / $58
= - 5.17%

4) Do you agree with the analysts' position regarding the retail chain in question 3, why or why not? If you were the owner of the retail chain would you continue to open stores? If not what would you do?

Answer:

- Agree with the analysts. Existing stores sales decreased from Year 1 to Year 2; growth declined 5.17%.

- I would not continue to open stores. I would address the decline in revenue / find out why the stores have negative growth in year 2.

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Worksheet: Metric 3 Market Share & Market Analytics

Use the industry overview below to answer the questions that follow:

Mobile Phones in the United States

The mobile phone market in the United States covers the sales of mobile phone devices, smart phones, and PDAs (personal digital assistants). Table X below provides the annual sales volume of mobile phones from 2004 to 2009. Table XX details the market share of the top handset manufacturers.

Table 1: US Mobile Phones: Sales Volume & Value 2004-2009

	2004	2005	2006	2007	2008	2009
'000 units	66,556.1	87,543.1	110,228.1	120,629.4	130,309.9	134,673.5
US$ bn	4.1	5.4	6.9	8.3	10.1	10.6

Table 2: Mobile Phones Company Shares 2005-2009

% retail revenue share	2005	2006	2007	2008	2009
Samsung America Inc	15.7	15.1	17.3	22.1	25.4
L.G. Electronics USA	15.9	16.5	15.2	20.6	21.5
Motorola Inc	30.4	34.8	33.5	22.8	16.4
Kyocera International Inc	5.4	4.9	4.0	9.2	9.9
Research in Motion Ltd	0.7	1.1	2.5	6.0	9.0
Apple Inc	-	-	-	4.9	7.4
Nokia United States	15.4	18.1	12.5	7.5	6.5
Sanyo North America Corp	4.3	4.2	4.5	-	-
Apple Computer Inc	-	-	1.4	-	-
Others	12.1	5.4	9.0	6.9	3.8
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

1) What is the annual 2009 revenue in dollars of the top 4 mobile phone companies?

Answer:
Revenue Market Share (%) = Revenue ($) / Total Market Sales Revenue ($)
Revenue ($) = Revenue Market Share (%) * Total Market Sales Revenue ($)

Samsung America Inc:
Revenue = 25.4% * $10.6 billion = 0.254 * $10.6 billion = $2.6924 billion

L.G. Electronics USA:
Revenue = 21.5% * $10.6 billion = 0.215 * $10.6 billion = $2.279 billion

Motorola Inc:
Revenue = 16.4% * $10.6 billion = 0.164 * $10.6 billion = $1.7384 billion

Kyocera International Inc:
Revenue = 9.9% * $10.6 billion = 0.099 * $10.6 billion = $1.0494 billion

2) If the performance of the US mobile phone market is expected to continue to grow from 2009 to 2012 at a rate of 5% per year, what will the size of the market be by the end of 2012?

Answer:
Revenue 2009 = $10.6 billion
Revenue 2010 = Revenue 2009 + 5% * Revenue 2009
= $10.6 billion + 0.05 * $10.6 billion
= $10.6 billion + $0.53 billion
= $ 11.13 billion
Revenue 2011 = Revenue 2010 + 5% * Revenue 2010
= $11.13 billion + 0.05 * $11.13 billion
= $11.13 billion + $0.5565 billion
= $11.6865 billion
Revenue 2012 = Revenue 2011 + 5% * Revenue 2011
= $11.6865 billion + 0.05 * $11.6865 billion
= $11.6865 billion + $0.584325 billion
= $12.270825 billion
= $12.271 billion

3) Large retail chains form a leading distribution channel in the US mobile phone market, accounting for 28% of the total value in 2009. In comparison, wireless service providers account for 23%, independent retailers 15%, and other sources account for 32%. Based on the 2009 revenues for the mobile phone market in the US, what is the share of revenue in dollars for each of the different distribution channels?

Answer:
Revenue Market Share (%) = Revenue ($) / Total Market Sales Revenue ($)
Revenue ($) = Revenue Market Share (%) * Total Market Sales Revenue ($)

Large Retail Chains:
Revenue = 28% * $10.6 billion = 0.28 * $10.6 billion = $2.968 billion

Wireless Service Providers:
Revenue = 23% * $10.6 billion = 0.23 * $10.6 billion = $2.438 billion

Independent Retailers:
Revenue = 15% * $10.6 billion = 0.15 * $10.6 billion = $1.590 billion

Other:

Revenue = 32% * $10.6 billion = 0.32 * $10.6 billion = $3.392 billion

4) Calculate the Three Firm Concentration Ratio and the Herfindahl Index for the US Mobile Phone market (using 2009 market share values). What can you infer about the market concentration from these two metrics?

Answer:

Three Firm Concentration Ratio = 25.4% + 21.5% + 16.4% = 63.3%

Herfindahl Index = Sum ([market share)∧2]
= Sum (.254∧2 + .215∧2 + .164∧2 + .099∧2 + .090∧2 +
.074∧2 + .065∧2 + .038∧2)
= 0.167

With the top 3 companies accounting for 63.3% of the market and a Herfindahl Index of 0.167 the market is not highly concentrated.

5) You have just become the Director of Retail Sales for a large US retail chain. What impact will the growing sales of mobile phones have on your business?

Answer:

- With a 5% increase per year, impact will be minor. Large retail chains sell thousands of products.
- There will likely be a similar increase in related products, such as chargers, skins, cases, travel chargers, prepaid phone cards, etc.
- There may be a need to increase inventory levels and shelf space devoted to mobile phones and related products
- There may be a slight increase in consumer flow into stores, which would affect cross and upselling other products to consumers walking in for mobile phones.

Worksheet: Metric 4 Contribution Margin

1) Mohan, an artist, draws caricatures on the waterfront pier. It costs him approximately $5 in materials (paper and markers) for each caricature he makes. He sells each caricature for $20. Calculate the contribution margin in terms of dollars and percent.

Answer:
Contribution Margin ($) = Revenue – COGS
= $20 - $5
= $15
Contribution Margin (%) = [Contribution per Unit ($) /
Sale Price per Unit ($)] * 100%
= [(Sale Price per Unit – Variable Cost per Unit) /
Sale Price per Unit] *100%
= [($20 - $5) / $20] * 100%
= [$15 / $20] * 100%
= 0.75 * 100%
= 75%

2) The Hotel Grill Bar sells a set lunch for $12. The food cost of sales used in producing each set lunch is $5. Additional variable costs are $3 per lunch. The fixed costs of the restaurant are $3 per meal. What is the contribution margin expressed in dollars and percent?

Variable Expenses = $5 + $3
= $8
Contribution Margin ($) = Revenue – Variable Expense
= $12 - $8
= $4
Contribution Margin (%) = [Contribution per Unit ($) /
Sale Price per Unit ($)] * 100%
= [(Sale Price per Unit – Variable Cost per Unit) /
Sale Price per Unit] * 100%
= [($12 - $8) / $12] * 100%
= $4 / $12 * 100%
= 0.33 * 100%
= 33.3%

3) You are an online retailer of CDs, promoting sales via a ‘no postage and packaging’ offer. You purchase your CDs from record companies for $18.75. Packaging and a padded envelope cost $1.00 per CD; and postage is $2.00. If you sell the CDs for $25 what is your contribution margin in dollars and percent?

Variable Expenses = $18.75 + $1.00 + $2.00
= $21.75
Contribution Margin ($) = Revenue – Variable Expense
= $25 - $21.75
= $3.25
Contribution Margin (%) = [Contribution per Unit ($) /
Sale Price per Unit ($)] * 100%
= [(Sale Price per Unit – Variable Cost per Unit) /
Sale Price per Unit] * 100%
= [($25 - $21.75) / $25] * 100%
= [$3.25 / $25] * 100%
= 0.13 * 100%
= 13%

4) You are the owner of an exclusive nightclub that is considering holding a New Year's Eve party. You have determined that you need a minimum contribution margin of 40% in order to turn a profit for a single night event at your club. Additionally, in hosting all-you-can-eat and all-you-can-drink events in the past, you know that the food cost is $20 per person and the beverage cost is $17 per person. Finally, the house band charges a fee of $5 per person in attendance. What should you charge for a ticket?

Answer:
Variable Expenses = Food + Beverage + Band
= $20 + $17 + $5
= $42
Contribution Margin (%) = [Contribution per Unit ($) /
Sale Price per Unit ($)]* 100%
= [(Sale Price per Unit – Variable Cost per Unit) /
Sale Price per Unit] * 100%
40% = [(Sale Price per Unit - $42) / Sale Price per Unit] * 100%
0.40 * Sale Price per Unit = Sale Price per Unit - $42
$42 = Sale Price per Unit – 0.4 * Sale Price per Unit
$42 = (1 – 0.4) * Sale Price Per Unit
Sale Price per Unit = $42 / 0.6
Sale Price per Unit = $70

5) As the owner of the nightclub in question 4, you learn that a neighbouring nightclub is selling tickets for their New Year's Eve party at $60/ticket, which is making your event less attractive. Should you lower your ticket price to match theirs given the variable costs in question 4 and knowing that your fixed costs will be $20/person? If not, why not and what might you do to increase tickets sales?

Answer:

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No. The nightclub would lose $2 per ticket sold if they matched the neighbouring club's price.

To increase sales:
- Reduce ticket price and reduce variable costs (lower priced food, drink, band)
- Ensure that event is differentiated in a way that justifies the premium ticket price
- Perhaps the other club is not offering all-you-can-eat or all-you-can-drink, or the band is not as well-known, if that's the case, ensure that your potential customers are aware of the differences

Worksheet: Metric 5 Mark-up & Margin

1) A computer software retailer uses a markup rate of 40%. If the retailer pays $25 each for computer games sold in its stores, how much do the games sell for?

Answer:
The markup is 40% of the $25 cost, so the markup is:
(0.40) * ($25) = $10

Then the selling price, being the cost plus markup, is:
$25 + $10 = $35

Therefore the games sell for $35.

2) A golf pro shop pays its wholesaler $40 for a certain club, and then sells that club to golfers for $75. What is the retail markup rate?

Answer:
The gross profit in dollars is calculated as sales price less cost:
$75 - $40 = $35

The markup rate is then calculated:
Markup (%) = Gross Profit / Cost *100
= $35 / $40 *100
= 87.5%

3) A shoe store uses a 40% markup on cost. Find the cost of a pair of shoes that sells for $63.

Answer:
The cost of the shoes is calculated as follows:
Selling Price = Cost + Markup ($)
= Cost + (Markup (%) * Cost)
$63 = Cost + (40% * Cost)
$63 = Cost + (0.4 * Cost)
$63 = (1 + 0.4) * Cost
$63 = 1.4 * Cost
Cost = $63 / 1.4
= $45

4) In 2009, Donna Manufacturing sold 100,000 widgets for $5 each, with a cost of goods sold of $2. What is the company's margin? Identify a way that Donna Manufacturing can increase its profit margin?

Answer:
First we have to calculate the gross profit:
Gross Profit = Selling Price – Cost of Goods Sold
= $5 - $2
= $3

Now we can calculate the margin:
Margin (%) = Gross Profit / Sales * 100
= $3 / $5 * 100
= 60%

Ways to increase the profit margin:
- Decrease cost of material
- Decrease cost of manufacturing
- Increase sales price per unit
- Decrease COGS

5) If a product costs $100 and is sold with a 25% markup at a retail store, what would be the retailer's margin on the product? What should be the markup and selling price if the retailer desires a 25% margin? Why might the retailer be seeking to increase their margin?

Answer:
(a) To calculate the margin, we first have to determine the sales price:
Markup ($) = Markup (%) * Cost
= 25% * $100
= $25
Selling Price = Cost + Markup ($)
= $100 + $25
= $125
Margin (%) = Markup / Price * 100
= $25 / $125 * 100
= 20%
Therefore the retailer's margin would be 20% when the product is sold at a 25% markup.
(b) To calculate the markup and selling price at a 25% margin:
Selling Price = Cost / (1 – Margin (%))
= $100 / (1 – 25%)
= $100 / (1 – 0.25)
= $133.33
Markup ($) = Selling Price – Cost

= $133.33 - $100
= $33.33

Markup (%) = Markup ($) / Cost * 100
= $33.33 / $100 * 100
= 33.33%

Therefore to obtain 25% margins, the product would have to be sold at $133.33 with a markup of 33.33%.

(c) Reasons for increase include:
- Increase in fixed costs (rent, tax, commission, wages, etc.)
- Increase in demand and/or decrease in supply
- Other competitors/retailers charge more for the product and the higher margin is a result of increasing sales price to match

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Worksheet: Metric 6 Pricing Wholesale to Retail

1) You are a manufacturer of widgets that sells your products to a wholesaler who in turn sells directly to retailers. You have developed a new widget and you know that your competition's product retails for $23 in hardware stores. You know yours is slightly better, and are pretty sure your product could sell for $27. Assuming a retail margin of 33.3% and a wholesale margin of 25%, what is the wholesaler's selling price, and how much can you sell the widgets to the wholesaler for?

   Answer:
   If the suggested retail price of the widget is $27, then:
   Wholesaler Selling Price ($) = Retail Selling Price * [1 - Retail Margin (%)]
   = $27 * (1 – 33.3%)
   = $27 * (1 – 0.333)
   = $18.00

   Manufacturer Selling Price = Wholesale Selling Price * [1 - Wholesale Margin]
   = $18.00 * (1 – 25%)
   = $18.00 * (1 – 0.25)
   = $13.50

2) As a small appliance manufacturer, your cost to manufacture and package your coffee maker is $10/unit. You want this to be a cash cow, so you decide to sell the coffee maker to your wholesaler for $19/unit. You know that the wholesaler's margin is 25%, and that retailers typically take 33.3% margins on small appliances. What will your coffee maker retail for rounded to the nearest whole number?

   Answer:
   Manufacturer Selling Price = Wholesale Selling Price * [1 - Wholesale Margin]
   Wholesale Selling Price = Manufacturer Selling Price / [1 - Wholesale Margin]
   = $19 / (1 – 25%)
   = $19 / (1 – 0.25)
   = $25.33

   Wholesale Selling Price = Retail Selling Price * [1 - Retail Margin]
   Retail Selling Price = Wholesale Selling Price / [1 - Retail Margin]
   = $$25.33 / (1 – 33.3%)
   = $25.33 / (1 – 0.333)
   = $37.98
   Therefore the coffee maker will retail for $38.00

3) A bearing manufacturer buys raw materials for $0.50 per unit, turns the raw materials into a roller bearing, and then sells the bearings to a wholesaler for $1.00 per unit. The wholesaler then sells the bearings to retailers for $2.00 per unit, and finally consumers buy the bearings for $3.00 per unit. What is the per unit margin in dollars for the manufacturer, wholesaler and retailer? What is the percentage margin for the manufacturer, wholesaler and retailer? What is the per unit margin in dollars and percentage margin for the entire chain?

Answer:

(a) Manufacturer margin ($) = $1.00 - $0.50 = $0.50
Wholesaler margin ($) = $2.00 - $1.00 = $1.00
Retailer margin ($) = $3.00 - $2.00 = $1.00

(b) Manufacturer margin (%) = $0.50 / $1.00 * 100 = 50%
Wholesaler margin (%) = $1.00 / $2.00 * 100 = 50%
Retailer margin (%) = $1.00 / $3.00 * 100 = 33.3%

(c) Chain margin ($) = $3.00 - $0.50 = $2.50
Chain margin (%) = $2.50 / $3.00 * 100 = 83.3%

4) If the raw material cost goes up by $0.25 per unit for the bearing manufacturer in question 3, what will be the retail price charged to consumers if all members in the chain maintain the same percent margin? What is the effect of the raw material increase to the consumer? Why is it important to understand channel margins and pricing practices?

Answer:

(a)
Manufacturer margin = 50%
Wholesaler margin = 50%
Retailer margin = 33.3%
Raw material cost = $0.50 + $0.25 = $0.75

Manufacturer margin = (Price – Cost) / Price * 100
50 = (Price - $0.75) / Price *100
0.5 * Price = Price - $0.75
$0.75 = Price – 0.5 * Price
$0.75 = Price (1 – 0.5)
Price = $0.75 / 0.5
= $1.50
Therefore the manufacturer sells the bearings for $1.50

Wholesaler margin = (Price – Cost) / Price * 100
50 = (Price - $1.50) / Price *100

0.5 * Price = Price - $1.50
$1.50 = Price – 0.5 * Price
$1.50 = Price (1 – 0.5)
Price = $1.50 / 0.5
= $3.00
Therefore the wholesaler sells the bearings for $3.00

Retailer margin = (Price – Cost) / Price * 100
33.3 = (Price - $3.00) / Price *100
0.333 * Price = Price - $3.00
$3.00 = Price – 0.333 * Price
$3.00 = Price (1 – 0.333)
Price = $3.00 / 0.667
= $4.50
Therefore the retailer sells the bearings for $4.50

(b) The price has increased by $1.50 to the consumer (or 50% increase).

(c) To evaluate the effects of price changes within the channel to the end consumer.

Worksheet: Metric 7 Break-Even

1) Apprentice Mousetraps wants to know how many units of its "Magic Mouse Trapper" it must sell to break even. The product sells for $20. It costs $5 per unit to make. The company's fixed costs are $30,000.

Answer:
Break-Even Volume (#) = Fixed Costs ($) / Contribution per Unit ($)
Contribution per Unit = Sales Price per Unit – Variable Cost per Unit
= $20 – $5
= $15
Break-Even Volume (#) = $30,000 / $15
= 2,000 mousetraps

2) Apprentice Mousetraps wants to know how many dollars' worth of its "Deluxe Mighty Mouse Trapper" it must sell to break even. The product sells for $40 per unit. It costs $10 per unit to make. The company's fixed costs are $30,000.

Answer:
Break-Even Revenue ($) = Fixed Costs ($) / Contribution Margin (%)
Contribution Margin (%) = Contribution per Unit / Selling Price per Unit
Contribution per Unit ($) = Price per Unit – Variable Cost per Unit
= $40 - $10
= $30
Contribution Margin (%) = $30 / $40 * 100
= 75%
Break-Even Revenue ($) = $30,000 / 75%
= $40,000

-OR-

Break-Even Revenue ($) = Break-Even Volume (#) * Price per Unit ($)
Break-Even Volume (#) = Fixed Costs ($) / Contribution per Unit ($)
Contribution per Unit = Sales Price per Unit – Variable Cost per Unit
= $40 – $10
= $30
Break-Even Volume (#) = $30,000 / $30
= 1,000 units
Break-Even Revenue ($) = 1,000 * $40
= $40,000

3) John's Clothing Store employs three salespeople. It generates annual sales of $1 million and an average contribution margin of 30%. Rent is $50,000. Each sales

person costs $50,000 per year in salary and benefits. How much would sales have to increase for John to break even on hiring an additional salesperson?

Answer:
If the additional fixed cost of a salesperson is $50,000 and with an average contribution margin of 30%, then:
Break-Even Revenue ($) = Fixed Costs ($) / Contribution Margin (%)
= $50,000 / 30%
= $166,666.67
Therefore sales would have to increase by $166,666.67 for John to break even on hiring an additional salesperson.

4) A corn farmer wishes to identify how many bushels of corn he must sell to cover his fixed cost at a given price. The farmer has costs consisting of $500 in real estate taxes, $700 interest on a bank loan, and $800 in other fixed expenses. The variable cost per bushel is $1, and covers labour, corn seed, herbicides and pesticides. If the price per bushel is $2, how many bushels must he sell to break even?

Answer:
Break-Even Volume (#) = Fixed Costs / Contribution per Unit
Fixed Costs = $500 + $700 + $800
= $2000
Contribution per Unit ($) = Price – Variable Cost per Unit
= $2 - $1
= $1
Break-Even Volume (#) = $2000 / $1
= 2000 bushels

5) If the farmer in question 4 sells only enough bushels to break even, what is his annual profit? Identify two ways the farmer could increase his annual profit.

Answer:
Farmer's annual profit = $0.

The farmer could increase his profit by:
- Growing more corn
- Increasing the price he charges per bushel
- Reducing his costs:
    - Pay off loan or find lower interest rate
    - Reduce labour costs
    - Find lower seed costs
    - Find lower herbicide and pesticide costs
- Changing to a more lucrative crop

- Find alternative use for the land that offers a better return

Worksheet: Metric 8 Return on Marketing Investment (ROMI)

1) A marketer is evaluating two marketing campaigns. It is estimated that Campaign 1 would generate incremental revenues of $250,000, at an incremental cost of $50,000 and a contribution margin of 30%. Campaign 2 would generate incremental revenues of $50,000, at an incremental cost of $20,000 and a contribution margin of 50%. If the marketer is basing their decision solely on ROMI, which campaign should they go ahead with?

Answer:
ROMI for Campaign 1 is found by:
$ROMI_{Campaign1}$ = (Incremental Revenue * Contribution Margin – Cost) / Cost
= ($250,000 * 30% - $50,000) / $50,000
= 50%
$ROMI_{Campaign2}$ = (Incremental Revenue * Contribution Margin – Cost) / Cost
= ($50,000 * 50% - $20,000) / $20,000
= 25%
Therefore the marketer should select Campaign 1.

2) A clothing retailer is considering investing in a newspaper advertising campaign to generate more sales. The campaign is expected to cost $3,000 in creative agency fees and $9,000 in circulation costs, while increasing revenues from $110,000 to $170,000. The retailer's contribution margin averages 25%. What would be the return on the marketing investment of the newspaper campaign?

Answer:
Incremental Revenue = $170,000 - $110,000 = $60,000
Marketing Costs = $3,000 + $9,000 = $12,000
ROMI = (Incremental Revenue * Contribution Margin – Cost) / Cost
= ($60,000 * 25% - $12,000) / $12,000
= 25%

3) An alternative option for the clothing retailer (in the previous question) is to invest in a direct mail campaign targeting previous customers – only a fraction of the reach of the newspaper campaign . The cost of the direct mail campaign would be $1,000, but would only result in increasing revenues to $150,000. What is the return on marketing investment in this case?

Answer:
Incremental Revenue = $150,000 - $110,000 = $40,000
ROMI = (Incremental Revenue * Contribution Margin – Cost) / Cost

= ($40,000 * 25% - $1,000) / $1,000
= 900%

4) If the clothing retailer (in the previous questions) decides to execute both the newspaper and direct mail campaign what would be the combined return on marketing investment.

Answer:
Newspaper Incremental Revenue = $60,000
Direct Mail Incremental Revenue = $40,000
Total Incremental Revenue = $60,000 + $40,000 = $100,000
Total Cost = $12,000 + $1,000 = $13,000
ROMI = (Incremental Revenue * Contribution Margin – Cost) / Cost
= ($100,000 * 25% - $13,000) / $13,000
= 92.31%

5) Which campaign should the clothing retailer in the previous questions execute for maximum return on marketing investment? If the retailer is more concerned with maximizing revenue growth, should they execute the newspaper campaign, direct mail campaign or both? Why?

Answer:
a) Direct mail campaign (900% ROMI) as it is significantly greater than the newspaper campaign (25%) and combined execution (92.31%).
b) Execute both as the revenue increase is $100,000; greater than the $60,000 as a result of the newspaper campaign and the $40,000 as a result of the direct mail campaign.