

Name(s):

Period:

Date:

# Ella's Game Emporium

## Accounting for Imports

### Expressions in Industry Assignment 2



An SB1070 Project

## Objectives

By the end of the day students should be able to write a multivariable expression to represent a real life situation. They should be able to evaluate that expression when given values for each variable.

## Building Expressions

<i>Problem &amp; Work -</i>	<i>Expression or answer</i>	<i>What does each variable stand for?</i>
<p>1. Ella plans to make a 50% markup on each item she sells in her store. Write an expression to use in order to calculate the sale price of each item.</p> <p><i>*A markup is the amount of money charged above the wholesale price of the item. This is the money that pays the bills and yields a profit.</i></p>		
<p>2. Kendama is a ball and stick game that originally comes from Japan. A lot of 10 of these games shipped from China will cost \$47.92 with free standard shipping. The import tax is 6.55%.</p> <div style="text-align: center;">  <p><a href="http://www.kendam-a-co.com/about/">http://www.kendam-a-co.com/about/</a></p> </div> <ol style="list-style-type: none"> <li>Write an expression to determine the cost of importing each lot of Kendama games.</li> <li>Simplify the expression by combining like terms</li> <li>Write an expression to determine the cost of importing more than 3 lots of the games if you get a 7% discount for buying 3 or more lots.</li> <li>How much will you spend to buy 4 lots?</li> <li>What is the cost of purchasing and importing each Kendama when you buy 4 lots?</li> <li>If you plan to sell these at a 50% profit, what will you sell these games for in the store?</li> <li>How many whole games will you need to sell to break even at this price? Write this in a full sentence</li> </ol>		

<i>Problem &amp; Work -</i>	<i>Expression or answer</i>	<i>What does each variable stand for?</i>
<p>3. A new German card game has a wholesale price of exactly \$6 with a flat \$21 fee for shipping. To import this game you will pay 5.63% duty on the price of the game (not the shipping cost)</p> <ol style="list-style-type: none"> <li>Write an expression to determine the cost of importing this game.</li> <li>Simplify the expression by combining like terms</li> <li>If you have a maximum \$150 to spend on the game, how many whole copies can you import?</li> <li>What will the actual cost of importing this number of games be</li> <li>What is the cost per game</li> <li>In order to make at least 50% profit, what is the minimum price will you charge for each game in the store?</li> </ol>		
<p>4. Any game store needs to stock up on traditional games, so you have decided to look into stocking chess sets. You have narrowed your sources down to the following options.</p> <p>Option 1: Each set has a wholesale price of \$8.75 with a set shipping cost of \$20. This set comes from Mexico so there is no import tax due to NAFTA.</p> <p>Option 2: Each set has a wholesale price of 6.95 with a set shipping cost of \$30. This set comes from Indonesia with an import tax of 4.5%.</p> <ol style="list-style-type: none"> <li>Write an expression you can use to determine the cost of ordering from either company.</li> <li>If you plan to order 5 chess sets, which company would have the best price?</li> <li>How many chess sets do you need to buy in order for the set from Indonesia to come in at the same cost as the set from mexico</li> <li>For future sales, what number of chess sets would you need to purchase to make it worth buying the less expensive set from Indonesia with a higher shipping and duties rather than the set from mexico? Answer in a full sentence.</li> </ol>		

<i>Problem &amp; Work -</i>	<i>Expression or answer</i>	<i>What does each variable stand for?</i>
<p>5. A popular board game in Australia has just started to sell internationally. As part of their advertisement for every 5 games you purchase you get one free. The wholesale cost per game is \$18.95, shipping is a flat rate of \$35 and the import tax rate is at 4.5% and applies to each game including the free games.</p> <p>a. Write an expression you can use to determine the cost of ordering this game assuming you order by lots of 6.</p> <p>b. Simplify your expression by solving for like terms</p> <p>c. What is the final cost per game if you purchase 12 games? Work:</p> <p>d. At this purchase price, what is the minimum sales price if you add a 50% markup? Work:</p> <p>e. What is the cost of purchasing 18games? Work:</p> <p>f. At this purchase price, what is the minimum sales price if you add a 50% markup? Work:</p>		

<i>Evaluate each expression</i>
<p>6. The expression <math>9e+15m-2(e+m)</math> gives the hourly shift personnel cost to the business to pay employees (e) and managers (m) if it costs an average of \$2 per hour for benefits.</p> <p>What is the cost of one 4 hour shift with 2 employees and 1 manager?</p>
<p>7. The gross earnings of your store can be calculated by the expression <math>9x+ 22y + 30z</math> where x represents a \$9 card game, y represents a \$22 book and z represents a \$30 board game.</p> <p>What is the total earnings of your store if you sell 3 card games one book and 4 board games?</p>

<b>Problem &amp; Work -</b>	<b>Expression or answer</b>
<p>8. The cost of a credit card transaction is calculated by the formula <math>0.03n+0.65</math> where <math>n</math> is the number of dollars spent, and it costs 65 cents per transaction plus there is a 3% transaction fee.</p> <p>Use google, or use your graphing calculator to graph this formula. If you are using google, just type GRAPH <math>0.03X+0.065</math> into the search bar on any device. You can click anywhere on the graphed line to see the X and Y coordinates.</p> <p>The X axis is the point where the store owner can make money. Any expenditures below this will actually cause the store to LOSE money because there is a 65 cent transaction fee.</p> <p><b>Approximate the following answers by looking at the graph:</b> What does it cost the business if a person spends just \$5 at the store?</p> <p>What does it cost the business if a person spends \$30 at the store?</p> <p><b>Evaluate the following answers by entering the values into the expression to find the numerical answer.</b> What does it cost the business if a person spends just \$5 at the store?</p> <p>What does it cost the business if a person spends \$30 at the store?</p>	<p>Draw the graph in the box below</p> <div style="background-color: #cccccc; height: 180px; border: 1px solid black;"></div> <p>Why is it most helpful to graph this using technology?</p> <p>What would make it difficult to graph this by hand?</p> <p>What is the slope of this line?</p> <p>At what point does the graph cross the X axis?</p>
<p>Ella's store has a \$10 minimum credit card purchase or a fee will be charged. Considering your answers above, describe Ella's reasoning for this policy.</p>	

*Evaluate each expression & give reasoning for your answer*

9. Suppose C is the price of a pack of cards made in China and M is the price of a pack of cards made in Mexico where  $M > C$ .

Explain which of the following pairs of expressions is larger based on these givens.

Expression A	Expression B	Which is bigger	Reasoning
$2M$	$2C$		
$\frac{M}{C}$	$\frac{C}{M}$		
$2M$	$M + C$		
$M - C$	$C - M$		
$2(M - C)$	$2M - C$		
$MC^2$	$CM^2$		
$(MC)^2$	$MC^2$		

### Career Spotlight - Custom's Agent

A custom's agent, or custom's broker, is paid to expedite movement of goods across the border. They are contracted by a company to file the paperwork needed and calculate any fees required for the goods to pass through customs quickly. These agents may work in a shipping port, a border crossing or at an airport depending on the type of goods they might specialize in. Most of these jobs are on the border or the in port cities on the coast.

**Average Annual Salary:** \$40,000-\$50,000

**Education Requirements:** A bachelor's degree in finance, business, international business or supply chain management is recommended for a career in this field.

**More information:** <http://www.bls.gov/oes/current/oes435011.htm>

<http://www.floridatechonline.com/resources/international-business/import-export-agent-career-and-salary-profile/#.VcOYM52rQy4>

### References

<http://www.dutycalculator.com/country-guides/Import-duty-taxes-when-importing-into-the-United-States/>

<http://www.kendama-co.com/about/>

## KEY

Expression or answer	What does each variable stand for?	Expression or answer	What does each variable stand for?
<b>1. <math>(X+.50X)</math> or <math>(1.5X)</math></b>	<i>X stands for the total cost of each item</i>	4. a. Option 1: $\$8.75n + \$20$	<i>n stands for the number of games</i>
<b>2.</b>  <b>a. <math>\\$47.92y+0.0655(\\$47.92y)</math></b>  <b>b. <math>51.059y</math></b> <b>c. <math>51.059y - .07(51.059y)</math></b> <b><math>=51.059y -3.57y</math></b> <b><math>= 47.485y</math></b> <b>d. <math>47.485(4) =\\$189.94</math></b> <b>e. <math>\\$189.94/(4 \times 10) = \\$4.748</math></b> <b>per Kendama</b> <b>f. <math>1.5(\\$4.748) = \\$7.122</math></b>  <b>g. <math>\\$189.94/7.122 = 26.67</math></b> <b>27 games must be sold to break even at this price.</b>	<i>y stands for the number of lots to be purchased</i>	Option 2: $\$6.95n + \$30 + 0.045(\$6.95n)$ $=\$7.263n + \$30$  b. Option 1 is the best price Option 1: $\$8.75(5) + \$20 = \$63.75$ Option 2: $\$7.263(5) + \$30 = \$66.315$ c. $8.75n+20=7.263n+30$ $n= 6.72$ d. If you are buying 7 or more sets it is less expensive to buy from Indonesia than Mexico.	
<b>3.</b>  <b>a. <math>6n + 21 +.0563(6n)</math></b>  <b>b. <math>6.338n + 21</math></b> <b>c. <math>6.338n+21=150</math></b> <b>20.35 games... only 20 games can be imported</b> <b>d. <math>6.338(20)+21=\\$147.76</math></b> <b>e. <math>\\$147.76/20 = \\$7.388</math></b> <b>f. <math>1.5(7.388)=\\$ 11.08</math></b>	<i>n=number of games</i>	5. a. $(\underline{\$18.95 \times 5})n + \$35 + 0.045(18.95n)$ 6 b. $15.79n + \$35 + 0.053n$ $= 16.644n + \$35$ c. $\underline{\$234.73} = \$19.56$ 12 d. $\$29.34$  e. $\underline{\$334.59} = \$18.59$ 18 f. $\$27.88$	<i>n is the number of games purchased</i>

**Evaluate each expression & give reasoning for your answer**

9. Suppose C is the price of a pack of cards made in China and M is the price of a pack of cards made in Mexico where  $M > C$ .

Explain which of the following pairs of expressions is larger based on these givens.

Expression A	Expression B	Which is bigger	Reasoning
$2M$	$2C$	Expression A	If M is greater than C, doubling both values will mean that $2M$ is greater than $2C$
$\frac{M}{C}$	$\frac{C}{M}$	Expression A	If M is greater than C, then Expression A will be over 1, and Expression B will be less than 1.
$2M$	$M + C$	Expression A	If M is greater than C, then expression A will double M, where as expression A adds a smaller value to M
$M - C$	$C - M$	Expression A	Since we know that M is greater than C, we know that Expression A will give a positive number but Expression B will give a negative number
$2(M - C)$	$2M - C$	Expression B	If you distribute the 2 in the first expression you find that you are comparing $2M - 2C$ with $2M - C$ , making it clear that the second expression would be larger
$MC^2$	$CM^2$	Expression B	In expression B the larger number is squared and will result in a larger answer
$(MC)^2$	$MC^2$	Expression A	In expression A the product of M and C is squared so you are squaring a larger value

