

BUSINESS CALCULUS

QUIZ 2 – LINEAR MODELS, QUADRATIC FUNCTIONS AND EXPONENTIAL FUNCTIONS

1) Simplify or solve the following exponential functions. Assume denominators do not equal 0.

a)  $(5x^2y)(2x^3y) = \underline{\hspace{2cm}}$

b)  $\frac{3x^3y^4}{27x^{-4}y^7} = \underline{\hspace{2cm}}$

c)  $(10q^{-2})^3 = \underline{\hspace{2cm}}$

d)  $\left(\frac{12a^{23.2}b^{34.8}c^{406.2}}{241a^{-15.5}b^{14.7}c^{-227.9}}\right)^0 = \underline{\hspace{2cm}}$

**Luna's Books sold 128 books in June. The total cost that month was \$1,700. In October, Luna's Books sold 248 books and the total cost was \$3,500.**

2) What is the marginal cost, monthly fixed cost and the linear cost equation for Luna's books?

3) The average price for each book at Luna's is \$17.00. What is the revenue and profit for June and October?

4) How many books must Luna's sell in order to make a profit of \$5,000?

After expanding her business and creating a website, Luna's new cost function is given below:

$$C(x) = \$21,500 + 150x - 25x^2$$

5) What is the vertex (highest point) of the above cost function?

6) What are the x and y intercepts of this cost function?

7) After starting to turn a profit, Luna's Books starts a business savings account for future expansion. Her goal is to make \$500,000 to expand into a shop at the local mall in five years. If she invests her money at a rate of 6.5% compounded monthly, what should her initial investment be?