**Notes**

1. Match the following functions with the given graphs and fill in the blanks with the appropriate numbers.
2. 
3. 
4. 

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| --- | --- | --- |
| **Graph A** | **Graph B** | **Graph C** |
|  |  |  |

1. Sketch a graph of the following functions:

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| --- | --- |
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|  |  |

1. Expand the functions from #2 so that they are in standard form, .
   1. 

* 1. 
  2. What is the value for “a” in both equations?
  3. How does the value for “b” relate to the numbers when factored?
  4. How does the value of “c” relate to the numbers when factored?

1. Factor the following functions:

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|  |  |

1. The revenue in thousands of dollars, *R*, when a company charges a price of *p* dollars for one of its products, is given by:

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* 1. Write *R(p)* in standard form.
  2. Write *R(p)* in factored form.
  3. For what price(s) does the company have no revenue? Which form is more useful for answering this question?

1. The height in feet above ground of a ball thrown upward from the top of a building *t* seconds after it is thrown is modeled by:

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* 1. Write S(t) in standard form.
  2. Write S(t) in factored form.
  3. What is the height of the building? Which form is more useful for answering this question?
  4. When will the ball land on the ground? Which form is more useful for answering this question?
  5. Sketch a graph of this function. Label the axes and all intercepts.



* 1. Find the maximum height of the ball and the time that it takes to obtain this height. Label this point on the graph.

1. **The daily profit**, ***f*** (in dollars), of a hot pretzel stand is a function of the **price per pretzel**, ***p*** (in dollars), given by:



* 1. Write  in factored form.
  2. Identify the vertical intercept.
  3. Interpret the vertical intercept in the context of the problem.
  4. Identify the horizontal intercept(s).
  5. Interpret the horizontal intercepts in the context of the problem.
  6. Determine the coordinates of the vertex of the parabola.
  7. Interpret the vertex in the context of the problem.
  8. Sketch a graph of this function. Label the axes, intercepts, and vertex.



* 1. What is a reasonable domain for this function if the pretzel stand would like to stay in business?
  2. Why is a quadratic function an appropriate model for profit as a function of the price per pretzel?