|  |
| --- |
| Your task is to locate or photograph an image of a real life parabola and then determine its equation. Try a web search using Google images, but be more specific than simply “parabola”. Make sure you choose or take a clear image that fills at least half of a page.  |

**Part A (APPLICATION 10)**Once you find or take an image, you need to draw grids on it using a web tool or traditionally using a pencil and a ruler. If you choose to use technology, the website at this link “<http://sporkforge.com/imaging/grid.php>” is quite user-friendly. Just choose a file from your device and upload it. When you finish adding a grid to your image download it to your computer. Now it is up to you where you want the vertex to be; however, make sure:

a) Your grids are spaced approximately 1 cm.

b) The vertex of the arch **does not fall** on the y-axis. (That would be too easy, no?)

c) There are two x-intercepts.

**Fully** label the key points of your graph including axes, the vertex, y-intercept and zeros, as well as any other points you use in Part B. 

(-3, 0)

(4, 2)

(11, 0)

**Part B (KNOWLEDGE 10)**1. Determine the equation of the parabola in **vertex form** using the vertex and another point on the graph that is not one of the x-intercepts.

2. Rewrite the equation from vertex form in step #1 into **standard form**, and use your answer to state the y-intercept.

**Part C (KNOWLEDGE 10)**3. Now starting again from the beginning (not from step #2), use the x-intercepts from the graph and another point on the graph that is not the vertex to write the equation of the parabola in **factored form.**

4. Rewrite the equation from **factored form** in step #3 into **standard form** and state the y-intercept.

**Part D (THINKING 5)**5. **Compare** your answers from #2 and #4 in part B. Are they the same or different? How are they different? How are they the same? Explain in detail any differences and give reasons why they might be different.

**Part E (COMMUNICATION 4)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Level Four** | **Level Three** | **Level Two** | **Level One** |
| Expression and organization of ideas and mathematical thinking | Expresses and organizes mathematical thinking with a high degree of effectiveness | Expresses and organizes mathematical thinking with considerable effectiveness | Expresses and organizes mathematical thinking with some effectiveness | Expresses and organizes mathematical thinking with limited effectiveness |
| Use of conventions, vocabulary, and terminology  | Uses conventions, vocabulary and terminology with a high degree of effectiveness | Uses conventions, vocabulary and terminology with considerable effectiveness | Uses conventions, vocabulary and terminology with some effectiveness | Uses conventions, vocabulary and terminology with limited effectiveness |