

NAME: _____

Dancing Fountains

You are a Landscape Designer who designs architectural water features for Safe-Rain...an international architectural fountain design company headquartered in Spain. A new client would like a dancing fountain similar to one of your company's earlier works which was installed in France. Check out the video of this fountain found at: <http://www.saferain.com/en/blog/how-to-make-a-dancing-fountain.html>

The dancing fountains in the above linked video display a beautiful and moving sensory representation of parabolas. The various sprays associated with this fountain resemble parabolas as shown on the graph found at: <https://www.desmos.com/calculator/mzywzidvfx>

1. Write the equation of one of the parabolas, in factored form, that has zeros of -11.5 and -6 and passes thru (-7,2). Then, test your equation by graphing the equation as a RED parabola on the image found at <https://www.desmos.com/calculator/mzywzidvfx>
2. Write the equation of a second parabola, in factored form, which is created by translating the above parabola 1 unit left and 1.5 units up. Then, test your equation by graphing the equation as a BLUE parabola on the image found at <https://www.desmos.com/calculator/mzywzidvfx>
3. Write the equation of a third parabola, in factored form, that has zeros of 11.5 and 6 and passes thru (7,2). Then, test your equation by graphing the equation as a GREEN parabola on the image found at <https://www.desmos.com/calculator/mzywzidvfx>
4. Write the equation of a fourth parabola, in factored form, which is created by translating the above parabola 1 unit left and 1.5 units up. Then, test your equation by graphing the equation as an ORANGE parabola on the image found at <https://www.desmos.com/calculator/mzywzidvfx>

EXTENSION

5. a) What is the domain of the RED parabola?
- b) What is the domain of the water fountain spray that the RED parabola is intended to model?
- c) Restrict the domain of the RED parabola by adding the restriction to the end of the equation so that the RED parabola is a more accurate model of the corresponding water spray.
6. a) What is the domain of the BLUE parabola?
- b) Restrict the domain of the BLUE parabola by adding the restriction, $\{-10 \leq x \leq -5\}$, to the end of the equation in Desmos so that the BLUE parabola will be a more accurate model of the corresponding water spray.
7. a) What is the domain of the GREEN parabola?
- b) What is the domain of the water fountain spray that the GREEN parabola is intended to model?
- c) Restrict the domain of the GREEN parabola by adding the restriction to the end of the equation so that the GREEN parabola is a more accurate model of the corresponding water spray.
8. a) What is the domain of the ORANGE parabola?
- b) Restrict the domain of the ORANGE parabola by adding a restriction to the end of the corresponding equation in Desmos so that the ORANGE parabola will be a more accurate model of the corresponding water spray.