

Model Rocket Science

In the metric system, the acceleration due to gravity is 9.8 m/s^2 . The quadratic function $h(t) = (1/2)(-9.8)t^2 + 50t + 30$ describes the rocket's projectile motion.

- What are the variables used in this function? What are their units of measure? What do they represent?
- What is the real-world meaning of $h(0) = 30$? What is another name we give this point?
- What shows that the acceleration due to gravity, or g , that the force is downward?
- Graph the function $h(t)$. What viewing window shows all the important parts of the parabola?
- How high does the rocket fly before falling back to Earth? When does it reach this point?
- How much time passes while the rocket is in flight, after the engine shuts down?
- What domain and range values make sense in this situation?
- Write the equation you must solve to find when $h(t) = 70$.
- When is the rocket 70 m above the ground? Use a calculator table to approximate your answers to the nearest tenth of a second.
- Describe how you determine when the rocket is at a height of 70 feet graphically.
- Summarize two new ideas you learned about quadratic equations from this activity.
- Solve this equation symbolically: $4(x - 1)^2 + 9 = 37$ Check your answer graphically and using a table on the graphing calculator.