

## Algebra II

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### 1 Comet ISON

In November of 2013, Comet ISON made its closest approach to the sun. The **perihelion**, or point where the comet is closest to the sun, came very close to the surface of the sun.

#### 1.1 Asteroid flyby

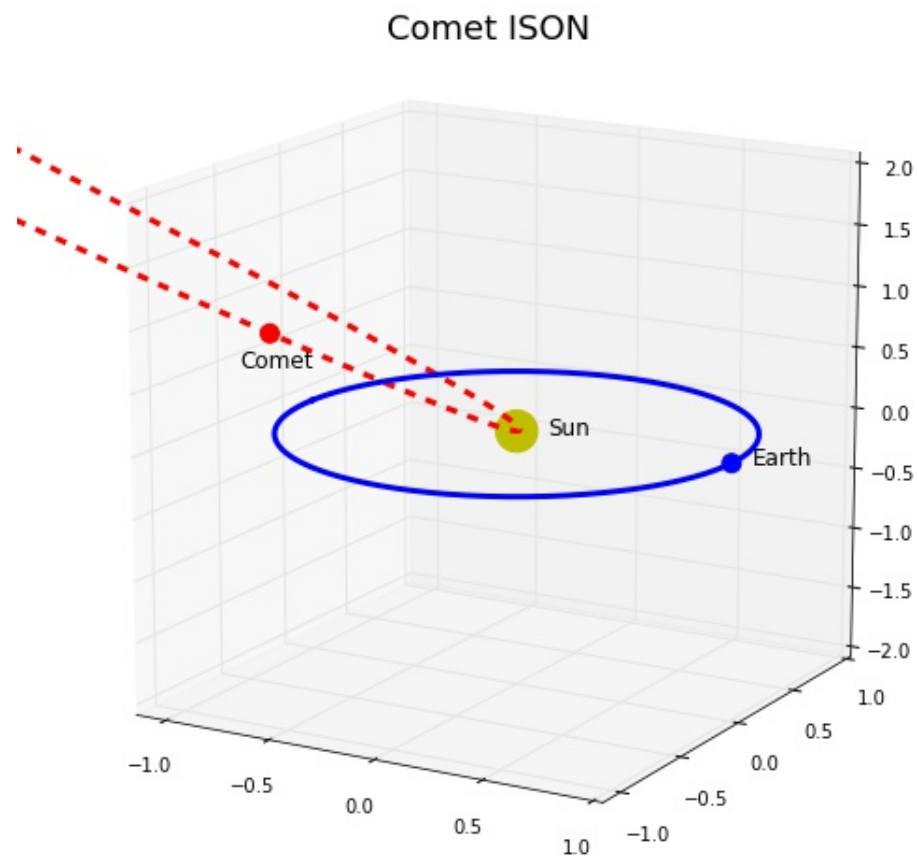


Figure 1: Comet ISON on its way to the Sun.

Table 1: Position data of a comet ISON on an approach to the Sun. This data is courtesy of [solarsystem.nasa.gov](http://solarsystem.nasa.gov)

Date	X (Millions kilometers)	Y (Million kilometers)
November 26, 18:00 UT	-10.5	+0.7
November 27, 13:00 UT	-8.8	+5.6
November 28, 01:00 UT	-7.7	+8.7
November 28, 08:00 UT	-6.3	+10.9
November 28, 14:00 UT	-4.6	+13.7
November 28, 23:00 UT	+3.2	+14.5
November 29, 10:00 UT	+6.6	+9.0
November 29, 19:00 UT	+8.0	+5.6
November 30, 10:00 UT	+9.3	+1.7

- Using your calculator, fit the data to a parabola
- Write down the values of the coefficients below:

$$y = A \cdot x^2 + B \cdot x + C$$

- $A =$
- $B =$
- $C =$

- Find the **perihelion** by doing the following:

- Find the axis of symmetry. Remember:

$$x = \frac{-B}{2A}$$

- Find  $y$  at the axis of symmetry by plugging it into your parabola

What are the  $x$  and  $y$  of perihelion?

- If the sun is located at  $x_2 = -0.4$ ,  $y_2 = 14.7$ , how far was the **perihelion** of Comet from the sun? Use your answer for the perihelion as  $x_1$  and  $y_1$

$$D = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$$