

## Conic Sections Quiz Answer Key PDF

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**Which conic sections can have a center at the origin? (Select all that apply)**

- A. Circle ✓**
- B. Ellipse ✓**
- C. Parabola
- D. Hyperbola ✓**

**Which of the following is a conic section?**

- A. Triangle
- B. Rectangle
- C. Circle ✓**
- D. Pentagon

**Which conic section has a directrix?**

- A. Circle
- B. Ellipse
- C. Parabola ✓**
- D. Hyperbola

**Which of the following are properties of a hyperbola? (Select all that apply)**

- A. Two branches ✓**
- B. Eccentricity greater than 1 ✓**
- C. A single focus
- D. Asymptotes ✓**

**In which conic section are the foci located inside the curve?**

- A. Circle
- B. Ellipse ✓**
- C. Parabola
- D. Hyperbola

**Which conic section is defined by the equation  $y = ax^2 + bx + c$ ?**

- A. Circle
- B. Ellipse
- C. Parabola ✓**
- D. Hyperbola

**What are the characteristics of a parabola? (Select all that apply)**

- A. A single focus ✓**
- B. A directrix ✓**
- C. Two axes of symmetry
- D. Vertex ✓**

**Which conic section can be used to model the path of a satellite orbitin Earth?**

- A. Circle
- B. Ellipse ✓**
- C. Parabola
- D. Hyperbola

**Compare and contrast the properties of an ellipse and a hyperbola.**

**Ellipses have a standard equation of the form  $(x-h)^2/a^2 + (y-k)^2/b^2 = 1$ , while hyperbolas have the form  $(x-h)^2/a^2 - (y-k)^2/b^2 = 1$ . Ellipses are bounded and have a finite area, while hyperbolas are unbounded and extend infinitely.**

**Provide a real-life example of a hyperbola and explain its application.**

**The trajectory of a satellite that approaches a planet and then escapes its gravitational pull can be modeled as a hyperbola.**

**Describe the role of the foci in defining an ellipse.**

The role of the foci in defining an ellipse is that they are two fixed points such that for any point on the ellipse, the sum of the distances to the two foci is constant.

**What is the eccentricity of a circle?**

- A. 0 ✓
- B. 1
- C. Greater than 1
- D. Less than 0

**Which conic sections have an eccentricity less than 1? (Select all that apply)**

- A. Circle ✓
- B. Ellipse ✓
- C. Parabola
- D. Hyperbola

**Explain how the eccentricity of a conic section affects its shape.**

Eccentricity ( $e$ ) affects the shape of conic sections as follows: for  $e < 1$ , the shape is an ellipse; for  $e = 1$ , it is a parabola; and for  $e > 1$ , it is a hyperbola.

**How does the equation of a parabola change when it is translated horizontally and vertically?**

The standard form of a parabola,  $y = a(x - h)^2 + k$ , changes to account for horizontal translation by modifying  $h$  and vertical translation by modifying  $k$ .

**Who is known for their significant contributions to the study of conic sections?**

- A. Euclid
- B. Pythagoras
- C. Apollonius of Perga ✓
- D. Archimedes

**In which fields are conic sections commonly applied? (Select all that apply)**

- A. Architecture ✓**
- B. Biology
- C. Engineering ✓**
- D. Astronomy ✓**

**Which transformations can be applied to conic sections? (Select all that apply)**

- A. Translation ✓**
- B. Rotation ✓**
- C. Reflection ✓**
- D. Scaling ✓**

**Discuss the significance of the directrix in the definition of a parabola.**

**The significance of the directrix in the definition of a parabola lies in its role in the geometric definition: a parabola is the set of all points that are equidistant from a fixed point (the focus) and a fixed line (the directrix).**

**What is the standard form of the equation for a horizontal ellipse?**

- A.  $(x-h)^2 + (y-k)^2 = r^2$
- B.  $(x-h)^2/a^2 + (y-k)^2/b^2 = 1$  ✓**
- C.  $(x-h)^2/b^2 - (y-k)^2/a^2 = 1$
- D.  $y = ax^2 + bx + c$