Ellipses Quiz Answer Key PDF

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Which of the following are true about the major axis of an ellipse? (Select all that apply)

A. It is the longest diameter. ✓

B. It passes through the center. ✓

C. It is always vertical.

D. It passes through both foci. ✓

Which equations represent an ellipse? (Select all that apply)

A. \frac{x^2}{a^2} + \frac{y^2}{ b^2} = 1 ✓

B. x^2 + y^2 = r^2

C. \frac{x^2}{ b^2} + \frac{y^2}{ a^2} = 1 ✓

D. x^2 - y^2 = 1

In which field are ellipses commonly used to describe planetary orbits?

A. Biology

B. Chemistry

C. Astronomy ✓

D. Geology

Which of the following are components of an ellipse? (Select all that apply)

A. Foci ✓

B. Major Axis ✓

C. Radius

D. Minor Axis ✓

Which property measures the deviation of an ellipse from being circular?

A. Diameter

B. Eccentricity ✓

C. Radius

D. Symmetry

If a > b in the ellipse equation, how is the ellipse oriented?

A. Vertically

B. Horizontally ✓

C. Diagonally

D. Symmetrically

Explain how the eccentricity of an ellipse is calculated and what it signifies.

The eccentricity of an ellipse is calculated using the formula e = c/a, where c is the distance from the center to a focus and a is the distance from the center to a vertex.

Describe the relationship between the major and minor axes in determining the orientation of an ellipse.

The major axis determines the longest diameter and orientation of the ellipse, while the minor axis is perpendicular to it and represents the shortest diameter.

What is the term for the two fixed points inside an ellipse?

A. Vertices

B. Centers

C. Foci ✓

D. Axes

What can affect the shape of an ellipse? (Select all that apply)

A. Length of the major axis ✓

B. Length of the minor axis ✓

C. Distance between the foci ✓

D. Diameter of the circle

Which component of an ellipse is the longest diameter?

A. Minor Axis

B. Major Axis ✓

C. Radius

D. tangent

How do the foci of an ellipse contribute to its definition?

The foci of an ellipse contribute to its definition by being the two fixed points such that the sum of the distances from any point on the ellipse to these foci is constant.

How can you derive the equation of an ellipse given the lengths of its axes and the position of its center?

The equation of the ellipse can be derived as $\frac{(x-h)^2}{a^2} + \frac{(y-k)^2}{ b^2} = 1$, where (h, k) is the center, a is the semi-major axis, and b is the semi-minor axis.

What is the midpoint of both the major and minor axes called?

A. Focus

B. Vertex

C. Center ✓

D. Endpoint

What changes occur to the shape of an ellipse when the distance between its foci is increased?

The ellipse becomes more elongated.

In which applications are ellipses commonly used? (Select all that apply)

A. Computer graphics ✓

B. Engineering ✓

C. Medicine

D. Physics ✓

Discuss the significance of ellipses in astronomy, particularly in describing planetary orbits.

Ellipses are significant in astronomy because they represent the shape of planetary orbits, as described by Kepler's first law, which states that planets move in elliptical orbits with the sun at one focus.

Which properties are characteristic of an ellipse? (Select all that apply)

A. Symmetrical about the major axis ✓

B. Symmetrical about the minor axis ✓

C. Has a constant radius

D. Has two foci ✓

What is the standard equation of an ellipse centered at the origin?

A. x^2 + y^2 = 1

B. \frac{x^2}{a^2} + \frac{y^2}{ b^2} = 1 ✓

C. x^2 - y^2 = 1

D. x^2 + y^2 = r^2

What is the eccentricity of a perfect circle?

A. 0 ✓

B. 0.5

C. 1

D. Greater than 1