Answers: 2D Conic Sections

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Summary

Answers to questions relating to the guide on introduction to 2D conic sections.

These are the answers to Questions: 2D Conic Sections.

Please attempt the questions before reading these answers!

Q1

1.1. Ellipse

1.2. Circle

1.3. Hyperbola

1.4. Parabola

1.5. Ellipse

1.6. Hyperbola

1.7. Ellipse

1.8. Parabola

1.9. Ellipse

1.10. Hyperbola

Q2

2.1.

Centre: $(2, -1)$

Radius: 4

2.2.

Centre: $(2, -3)$

Radius: 5

2.3.

Centre: $(-4, 5)$

Radius: $4\sqrt{2}$

2.4.

Centre: $(3, -2)$

Foci: $(3 \pm \sqrt{5}, -2)$

2.5.

Centre: $(-1, 4)$

Foci: $(-1, \pm\sqrt{7}, 4)$

2.6.

Centre: $(1, -2)$

Foci: $(1, -2 \pm \sqrt{5})$

2.7.

Centre: $(1, -3)$

Foci: $(1, -3 \pm \sqrt{7})$

2.8.

Centre: $(3, -1)$

Foci: $(3 \pm \sqrt{3}, -1)$

2.9.

Centre: $(1, 3)$

Foci: $(1 \pm \sqrt{3}, 3)$

2.10.

Centre: $(2, -2)$

Foci: $(2 \pm \sqrt{7}, -2)$

2.11.

Vertex: $(2, 3)$

Focus: $(2, \frac{13}{4})$

Directrix: $y = 3 - \frac{1}{4}$

2.12.

Vertex: $(-1, 2)$

Focus: $(-1, 4)$

Directrix: $y = 0$

2.13.

Vertex: $(2, -3)$

Focus: $(1, -3)$

Directrix: $x = 3$

2.14.

Vertex: $(3, 1)$

Focus: $(3, 2)$

Directrix: $y = 0$

2.15.

Vertex: $(4, -4)$

Focus: $(3, -4)$

Directrix: $x = 5$

2.16.

Centre: $(2, 1)$

Foci: $(2 \pm \sqrt{1}3, -1)$

Vertices: $(2 \pm 3, -1)$

2.17.

Centre: $(-1, 3)$

Foci: $(-1, 3 \pm 5)$

Vertices: $(-1, 3 \pm 4)$

2.18.

Centre: $(1, 2)$

Foci: $(1 \pm 5, 2)$

Vertices: $(1 \pm 4, 2)$

2.19.

Centre: $(2, -3)$

Foci: $(2 \pm \sqrt{8}, -3)$

Vertices: $(2 \pm 2, 2)$

2.20.

Centre: $(-3, 2)$

Foci: $(-3, 2 \pm 3)$

Vertices: $(-3, 2 \pm \sqrt{13})$

Version history and licensing

v1.0: initial version created 11/25 by Abigail Carpenter as part of a University of St Andrews VIP project.