## Lecture 39: Ellipses

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# Question 1.

Which of the following are correct? There are several correct answers, but you only need to choose one to earn credit.

- A An ellipse looks like a flattened circle.
- B Given two points F and G, an ellipse is the collection of all points P such that the sum dist(P, F) + dist(P, G) is constant.
- C In part (B), the points F and G are called the foci.
- D The collection of points (x, y) so that  $x^2/5 + y^2/7 = 1$  is an ellipse.
- E The collection of points (*x*, *y*) so that  $x^2/5 y^2/7 = 1$  is an ellipse.



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- E The collection of points (x, y) so that  $x^2/5 y^2/7 = 1$  is an ellipse.

Answer A-D are correct.



### Question 2.

Consider the ellipse

$$\frac{x^2}{4} + \frac{y^2}{9} = 1.$$

Which is correct?

- A The major axis for the ellipse is on the *y*-axis and is of length 4.B The major axis for the ellipse is on the *x*-axis and is of length 4.
- C The major axis for the ellipse is on the y-axis and is of length 9.
- D The major axis for the ellipse is on the y-axis and is of length 6.
- E The major axis for the ellipse is on the x-axis and is of length 6.



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- B The major axis for the ellipse is on the *x*-axis and is of length 4.
- C The major axis for the ellipse is on the y-axis and is of length 9.
- D The major axis for the ellipse is on the y-axis and is of length 6.
- E The major axis for the ellipse is on the *x*-axis and is of length 6.

The *y*-intercepts are  $(0, \pm 3)$  and the *x*-intercepts are the points  $(\pm 2, 0)$ . The distance between the *y*-intercepts is longer so the *y*-axis contains the major ellipse.



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#### Question 3.

Find the center of the ellipse

$$x^2 - 6x + 2y^2 + 8x = 0.$$

A (3,4) B (3,-2) C (6,-2) D (-3,2) E (-3,4)



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### Question 3.

Find the center of the ellipse

$$x^2 - 6x + 2y^2 + 8x = 0.$$

- A (3,4)
- **B** (3, -2)
- C (6, -2)
- D (-3,2)
- E(-3,4)

Completing the square gives  $(x - 3)^2 + 2(y + 2)^2 = 9 + 8$ . Center is (3, -2).



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