

Precalculus - Conic Sections - Quiz

Common Core G-GPE.A.1, G-GPE.A.2, G-GPE.A.3 · maths-pdf.fr/en/

Name: _____ Class: _____ Date: ____/____/____

Pick the best answer for 10 questions on conic sections. Explanations name common slips, such as adding instead of subtracting in the ellipse relation.

Precalculus · Common Core State Standards: **G-GPE.A.1, G-GPE.A.2, G-GPE.A.3**

Questions

Question 1

What is the radius of $(x-1)^2 + (y+3)^2 = 49$?

- A. 49
- B. 3.5
- C. 7
- D. 1

Question 2

What is the focus of $x^2 = 20y$?

- A. (0,5)
- B. (0,20)
- C. (5,0)
- D. (0,10)

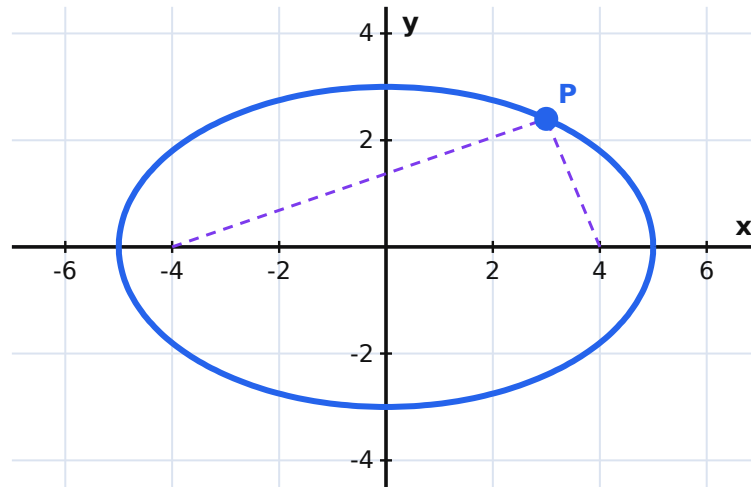
Question 3

Which equation is an ellipse?

- A. $\frac{x^2}{9} - \frac{y^2}{4} = 1$
- B. $\frac{x^2}{9} + \frac{y^2}{4} = 1$
- C. $x^2 + y^2 = 9$
- D. $y = x^2$

Question 4

For the ellipse shown, what are the foci?

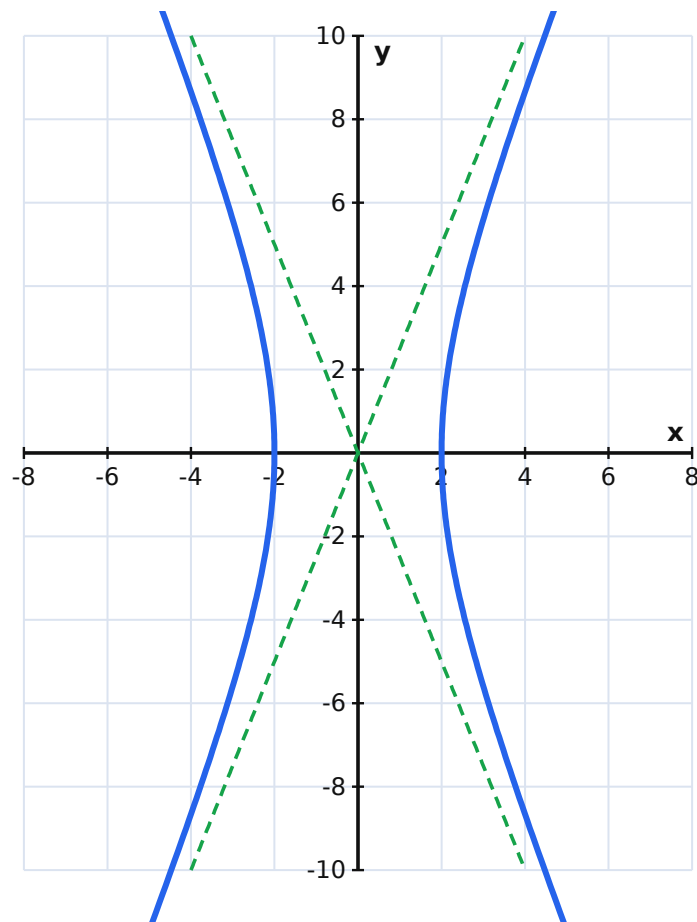


Ellipse $x^2/25 + y^2/9 = 1$.

- A. $(\pm 5, 0)$
- B. $(\pm 3, 0)$
- C. $(0, \pm 4)$
- D. $(\pm 4, 0)$

Question 5

What are the asymptotes of $\frac{x^2}{4} - \frac{y^2}{25} = 1$?



Hyperbola.

- A. $y = \pm \frac{5}{2}x$
- B. $y = \pm \frac{2}{5}x$
- C. $y = \pm 5x$
- D. $y = \pm \frac{25}{4}x$

Question 6

For a hyperbola with $a=3$ and $b=4$, what is c ?

- A. 7
- B. 5
- C. 1
- D. $\sqrt{7}$

Question 7

What is the directrix of $y^2=8x$?

- A. $x=2$
- B. $y=-2$
- C. $x=-2$
- D. $x=-8$

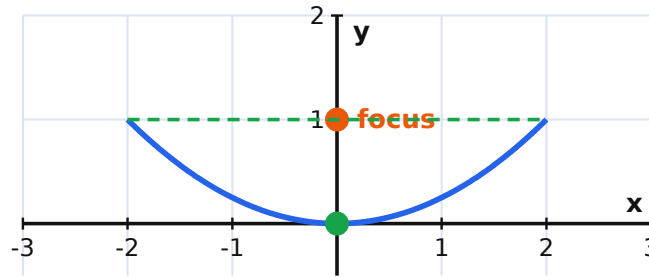
Question 8

Complete the square: the center of $x^2 + y^2 - 10x + 6y + 9 = 0$ is...

- A. $(5, -3)$
- B. $(-5, 3)$
- C. $(10, -6)$
- D. $(5, 3)$

Question 9

A satellite dish is a parabola. Where does the receiver go (see the dish)?



Dish cross-section.

- A. At the vertex
- B. At the focus
- C. On the directrix
- D. At the rim

Question 10

Which conic has two branches?

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

Answers

1. **C** - $r^2 = 49$, so $r = 7$.
2. **A** - $4p = 20$, so $p = 5$, and the focus is p units above the vertex.
3. **B** - An ellipse has a plus sign and different denominators.
4. **D** - $c = \sqrt{25 - 9} = 4$ on the horizontal major axis.
5. **A** - $y = \pm (b/a)x$ with $b = 5$ and $a = 2$.
6. **B** - $c^2 = a^2 + b^2 = 25$, so $c = 5$. For an ellipse you would subtract.
7. **C** - $4p = 8$, $p = 2$. The parabola opens right, so the directrix is $x = -p = -2$.
8. **A** - $x^2 - 10x + 25$ and $y^2 + 6y + 9$ give $(x - 5)^2 + (y + 3)^2 = 25$.
9. **B** - Signals parallel to the axis reflect to the focus.
10. **D** - A hyperbola consists of two separate branches.

Remember

- Circle: $(x - h)^2 + (y - k)^2 = r^2$.
- Parabola: $(x - h)^2 = 4p(y - k)$; focus is p from the vertex and the directrix is on the opposite side.
- Ellipse: $x^2/a^2 + y^2/b^2 = 1$ with $c^2 = a^2 - b^2$; the foci lie on the major axis.
- Hyperbola: $x^2/a^2 - y^2/b^2 = 1$ with $c^2 = a^2 + b^2$ and asymptotes $y = \pm (b/a)x$.
- Complete the square to find the center or vertex.