

keep scrolling to get  
a sneak peek!

Help your PreCalculus students  
review **conic section - ellipses**  
skills with these space themed  
review stations!

Students will be eager to get  
the self-checking & student  
choice benefits from these  
activities!

# CONIC SECTIONS: ELLIPSES REVIEW

## PreCalculus Stations

**ANSWER KEY**

**STATION 1: ROCKET LAUNCH MATCH!**  
Directions: Start with any question and answer it. Draw a line to the answer. Then write the letter in the long box below.

Find the center of the ellipse:  $\frac{(x-3)^2}{25} + \frac{(y+2)^2}{9} = 1$       (-6, -5) & (8, -5)      (-3, 7) & (-3, -3)      (2, 6)      (-7, 4) & (5, 4)

Find the vertices of the ellipse:  $\frac{(x+1)^2}{36} + \frac{(y-4)^2}{16} = 1$

Find the co-vertices of the ellipse:  $\frac{(x-6)^2}{4} + \frac{(y+3)^2}{49} = 1$

Find the foci of the ellipse:  $\frac{(x+4)^2}{64} + \frac{(y-2)^2}{9} = 1$

Find the foci of the ellipse:  $\frac{(x-2)^2}{20} + \frac{(y+1)^2}{5} = 1$

Find the foci of the ellipse:  $\frac{(x-3)^2}{16} + \frac{(y-4)^2}{9} = 1$

**STATION 2: SATELLITE INTERSECTION**  
Directions: Graph each ellipse and identify the key features. Write the letter that your ellipse crosses through in the corresponding question number at the bottom to reveal a mystery.

1.  $\frac{(x-2)^2}{25} + \frac{(y+1)^2}{9} = 1$

2.  $\frac{(x+4)^2}{16} + \frac{(y-3)^2}{36} = 1$

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

6.  $\frac{(x-6)^2}{9} + \frac{(y+2)^2}{25} = 1$

**12** Given the information below, find the center, vertices and the foci of the ellipse.

**3** Given the information below, find the center, vertices and the foci of the ellipse.

**8** Given the information below, find the center, vertices and the foci of the ellipse.

Center: (2, -1)  
Vertices: (-3, -1) & (7, -1)

Center: (-4, 3)  
Vertices: (-4, 9) & (-4, -3)

Center: (0, 0)  
Vertices: (-7, 0) & (7, 0)  
Co-vertices: (0, 3) & (0, -3)



4 Station Activities & Answer Keys

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Why do you need this?

# Ellipses Conic Sections Review Stations



There are a variety of activities that cover several topics.



Help your students practice these essential math skills.



The activities have self-checking components so students can receive feedback!

The collage features several worksheets for reviewing ellipse concepts:

- STATION 1: ROCKET LAUNCH**: Contains six problems (1-6) where students find the center, vertices, co-vertices, and foci of ellipses given their equations. For example, problem 1:  $\frac{x^2}{36} + \frac{y^2}{16} = 1$ .
- STATION 4: ORBIT PRACTICE**: Contains eight problems (7-12) where students find the center, vertices, co-vertices, and foci of ellipses given their equations. For example, problem 7: Center: (0,0) Horizontal;  $V: (-8,0) + (8,0)$ ;  $a=8 \rightarrow a^2=64$ .
- ANSWER KEY**: Provides solutions for the problems in Station 1 and Station 4. For example, for problem 1, the center is (0,0), vertices are (6,0) and (-6,0), co-vertices are (0,4) and (0,-4), and foci are (5,0) and (-5,0).
- WRITING EQUATIONS OF ELLIPSES IN STANDARD FORM CIRCUIT**: A self-checking activity where students write the equation of an ellipse in standard form given its center, vertices, and foci. It includes a grid for graphing the ellipse.

# Ellipses Conic Section Review Stations *includes:*

Name: **Answer Key** Date: \_\_\_\_\_

## STATION 2: SATELLITE INTERSECTION

Directions: Graph each ellipse and identify the key features. Write the letter that your graph crosses through in the corresponding question number at the bottom to reveal a mystery word.

1.  $\frac{(x-2)^2}{25} + \frac{(y+1)^2}{9} = 1$

Center: (2, -1)  
Vertices: (-3, -1) & (7, -1)  
Co-vertices: (2, 2) & (2, -4)

2.  $\frac{(x+4)^2}{16} + \frac{(y-3)^2}{36} = 1$

Center: (-4, 3)  
Vertices: (-4, 9) & (-4, -3)  
Co-vertices: (-8, 3) & (0, 3)

3.  $\frac{x^2}{16} + \frac{y^2}{9} = 1$

Center: (0, 0)  
Vertices: (4, 0) & (-4, 0)  
Co-vertices: (0, 3) & (0, -3)

4.  $\frac{(x-1)^2}{4} + \frac{(y+2)^2}{25} = 1$

Center: (1, -2)  
Vertices: (1, 3) & (1, -7)  
Co-vertices: (3, -2) & (-1, -2)

The \_\_\_\_\_  
2            4

## WRITING EQUATIONS OF ELLIPSES IN STANDARD FORM CIRCUIT

Previous Answer:  $\frac{(x+3)^2}{16} + \frac{(y-4)^2}{36} = 1$  # \_\_\_\_\_

5. Given the information, write the equation of the ellipse in standard form.

Previous Answer:  $\frac{(x+2)^2}{9} + \frac{(y-3)^2}{4} = 1$  # \_\_\_\_\_

6. Given the information, write the equation of the ellipse in standard form.

1. Given the information below, find the center, vertices, co-vertices and the foci of the ellipse.

$$\frac{x^2}{36} + \frac{y^2}{16} = 1$$

2. Given the information below, find the center, vertices, co-vertices and the foci of the ellipse.

$$\frac{x^2}{25} + \frac{y^2}{49} = 1$$

3. Given the information below, find the center, vertices, co-vertices and the foci of the ellipse.

$$\frac{(x-2)^2}{49} + \frac{(y+3)^2}{9} = 1$$

4. Given the information below, find the center, vertices, co-vertices and the foci of the ellipse.

$$\frac{(x+1)^2}{16} + \frac{(y-4)^2}{64} = 1$$

5. Given the information below, find the center, vertices, co-vertices and the foci of the ellipse.

$$\frac{(x-5)^2}{100} + \frac{(y+1)^2}{36} = 1$$

6. Given the information below, find the center, vertices, co-vertices and the foci of the ellipse.

$$\frac{(x+4)^2}{9} + \frac{(y-2)^2}{25} = 1$$

- ✓ 4 printable station activities
- ✓ answer keys
- ✓ teacher & student directions
- ✓ color & printer-friendly versions

# station 1 | - Rocket Launch Match

## Skill: Identifying Key Features of an Ellipse

Students will be given ellipses in various forms and identify key characteristics like the center, vertices, co-vertices, and foci. Students will connect the question to the answer (planet) to identify a letter in the mystery word. This is **self-checking** since the word that is revealed must be spelled correctly.

### Includes:

- 8 questions
- recording sheet to show work
- detailed answer key

Name: **ANSWER KEY** Date: \_\_\_\_\_ Class: \_\_\_\_\_

### STATION 1: ROCKET LAUNCH MATCH!

Directions: Start with any question and answer it. Draw a line to the answer. Then write the letter in the long box below.

1 Find the center of the ellipse:  $\frac{(x-3)^2}{25} + \frac{(y+2)^2}{9} = 1$

2 Find the vertices of the ellipse:  $\frac{(x+1)^2}{36} + \frac{(y-4)^2}{16} = 1$

3 Find the co-vertices of the ellipse:  $\frac{(x-6)^2}{4} + \frac{(y+3)^2}{49} = 1$

4 Find the foci of the ellipse:  $\frac{(x+4)^2}{64} + \frac{(y-1)^2}{28} = 1$

5 Find the foci of the ellipse:  $\frac{(x-2)^2}{20} + \frac{(y+6)^2}{45} = 1$

6 Find the co-vertices of the ellipse: Center:  $(-3, 2)$   
 $a = 6, b = 5$

7 Find the vertices of the ellipse: Center:  $(1, -5)$   
 $a = 7, b = 4$

8 Find the center of the ellipse:  $4x^2 + 9y^2 + 16x - 54y + 61 = 0$

Directions: Write down the letter from each correct answer in the space below. Use the hint to unscramble the word before moving on to the next station.

Hint: A small rocks orbiting the sun. A bunch of these together can be found in a belt.

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# station 2 - Satellite Intersection

## Skill: Graphing Ellipses & Identifying Key Features

Students will graph the given ellipse equation in standard form and identify key features. The correct graph will intersect a satellite with a letter on it. This is self-checking because the letters will reveal a mystery word at the bottom.

### Includes:

- 6 questions
- Detailed answer key

Name: **Answer Key** Date: \_\_\_\_\_

### STATION 2: SATELLITE INTERSECTION

Directions: Graph each ellipse and identify the key features. Write the letter that your graph crosses through in the corresponding question number at the bottom to reveal a mystery word.

1.  $\frac{(x-2)^2}{25} + \frac{(y+1)^2}{9} = 1$

Center:	(2, -1)
Vertices:	(-3, -1) & (7, -1)
Co-vertices:	(2, 2) & (2, -4)

2.  $\frac{(x+4)^2}{16} + \frac{(y-3)^2}{36} = 1$

Center:	(-4, 3)
Vertices:	(-4, 9) & (-4, -3)
Co-vertices:	(0, 3) & (-8, 3)

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

Center:	
Vertices:	
Co-vertices:	

4.  $\frac{(x-1)^2}{4} + \frac{(y+2)^2}{25} = 1$

Center:	(1, -2)
Vertices:	(1, 3) & (1, -7)
Co-vertices:	(3, -2) & (-1, -2)

5.  $\frac{(x+1)^2}{36} + \frac{(y-2)^2}{16} = 1$

Center:	
Vertices:	
Co-vertices:	

6.  $\frac{(x-6)^2}{9} + \frac{(y+2)^2}{25} = 1$

Center:	
Vertices:	
Co-vertices:	

The \_\_\_\_\_ we live in is called the Milky Way.

2      4      3      6      5      1

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# station 3 - Shooting Star Circuit

## Skill: Writing Ellipse Equations Given a Graph or Expanded Form

With this self-checking circuit worksheet, students will start with question 1, write the equation of the ellipse given the information, and search for the answer above their next problem to solve. They will have completed the circuit correctly if they answer all the problems and end back up at the first question to complete the loop.

### Includes:

- 8 questions
- detailed answer key

**WRITING EQUATIONS OF ELLIPSES IN STANDARD FORM CIRCUIT**

Previous Answer:  $\frac{(x+3)^2}{16} + \frac{(y-4)^2}{36} = 1$  #

5. Given the information, write the equation of the ellipse in standard form.

Previous Answer:  $\frac{(x+2)^2}{4} + \frac{(y+2)^2}{4} = 1$  #

6. Given the information, write the equation of the ellipse in standard form.

Previous Answer:  $\frac{(x+1)^2}{4} + \frac{(y+2)^2}{4} = 1$  #

7. Given the information, write the equation of the ellipse in standard form.

Previous Answer:  $\frac{(x-2)^2}{36} + \frac{(y+2)^2}{9} = 1$  #

8. Given the information, write the equation of the ellipse in standard form.

$$9x^2 + 16y^2 - 18x + 64y - 71 = 0$$

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**QUESTIONS OF ELLIPSES IN STANDARD FORM CIRCUIT**

Date: \_\_\_\_\_

Write the equation of the ellipse that starts and ends at the same place. Start in the first box labeled 1. Search through the remaining boxes for the answer you got for question 1. Continue until you have completed the questions and you are back at your path below.

8 → 2 → 5 → 3 → 6 → 4 → 1

Previous Answer:  $\frac{(x-1)^2}{16} + \frac{(y+2)^2}{9} = 1$  #

2. Given the information, write the equation of the ellipse in standard form.

Vertical  
Center: (-3,4)  
a = 4 b = 6  
a² = 16 b² = 36  
h = -3 k = 4

$$\frac{(x+3)^2}{16} + \frac{(y-4)^2}{36} = 1$$

Previous Answer:  $\frac{(x-5)^2}{9} + \frac{(y+2)^2}{25} = 1$  #

3. Given the information, write the equation of the ellipse in standard form.

$$9x^2 + 4y^2 - 36x + 16y + 16 = 0$$
$$9x^2 - 36x + 4y^2 + 16y = -16$$
$$9(x^2 - 4x + 4) + 4(y^2 + 4y + 4) = -16 + 36 + 16$$
$$9(x-2)^2 + 4(y+2)^2 = 36$$
$$\frac{(x-2)^2}{4} + \frac{(y+2)^2}{9} = 1$$

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# station 4 - Orbit Practice

## Skill: Identifying Key Features of Ellipses from Equations & Graphs

Given the equation or graph of an ellipse, students will need to identify the center, vertices, co-vertices, and foci. These task cards can be self-checking if you choose to print them with the answers on the back.

### Includes:

- 12 questions
- recording sheet
- Answer key

**1** Given the information below, find the center, vertices, co-vertices and the foci of the ellipse.

$$\frac{x^2}{36} + \frac{y^2}{16} = 1$$

**2** Given the information below, find the center, vertices, co-vertices and the foci of the ellipse.

$$\frac{x^2}{25} + \frac{y^2}{49} = 1$$

**3** Given the information below, find the center, vertices, co-vertices and the foci of the ellipse.

$$\frac{(x-2)^2}{49} + \frac{(y+3)^2}{16} = 1$$

**4** Given the information below, find the center, vertices, co-vertices and the foci of the ellipse.

$$\frac{(x+1)^2}{16} + \frac{(y-4)^2}{64} = 1$$

**5** Given the information below, find the center, vertices, co-vertices and the foci of the ellipse.

**6** Given the information below, find the center, vertices, co-vertices and the foci of the ellipse.

**3** Given the information below, find the center, vertices, co-vertices and the foci of the ellipse.

$$\frac{(x-2)^2}{49} + \frac{(y+3)^2}{16} = 1$$

center: (2, -3)  
 v: (-5, -3) & (9, -3)  
 cv: (2, 0) & (2, -6)  
 foci: (2 - 2√10, -3) & (2 + 2√10, -3)

**10** Given the information below, find the center, vertices, co-vertices and the foci of the ellipse.

# Ellipses Conic Sections Review Stations

standards covered:

**CCSS:** HSG-GPE.A.3

**TEKs:** P.3.H

**VA SOLs:** AG.MA.6

**STATION 1: ROCKET LAUNCH MATCH!**

**Teacher Directions:**  
At this station, students will be practicing to identify the center, vertices, co-vertices, or foci of the given ellipse. Once students have their correct answer, they are going to record the letter underneath the soccer goal net at the bottom of the page. Once all the questions are answered, students will unscramble the letters to form the word "asteroid".

This station is self-checking, as incorrect solutions may not appear as an answer choice.

**Printing Directions:**

- Print enough copies of the Rocket Launch Match! and the recording worksheets for each student.
- I recommend NOT printing double sided.

is an answer key is included.

**3** Given the information below, find the center, vertices, co-vertices and the foci of the ellipse.

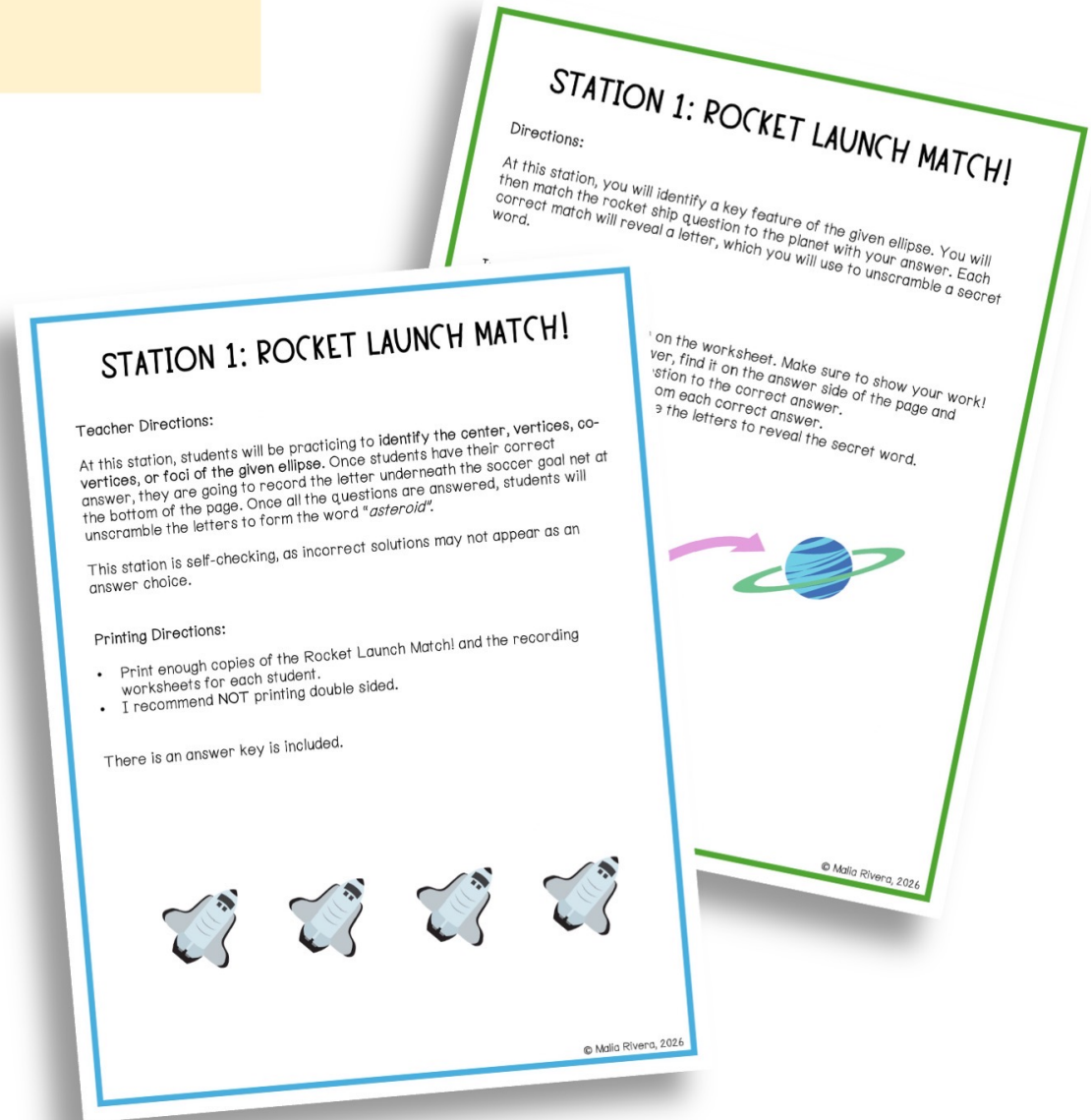
$$\frac{(x - 2)^2}{49} + \frac{(y + 3)^2}{10} = 1$$

center:  $(2, -3)$   
v:  $(-5, -3)$  &  $(9, -3)$   
cv:  $(2, 0)$  &  $(2, -6)$   
foci:  $(2 - 2\sqrt{10}, -3)$  &  $(2 + 2\sqrt{10}, -3)$

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# Space Ellipse Review Stations

Teacher and printing directions included. Student directions to be printed at each station are also included!



# how to use this resource

**1** Given the information below, find the center, vertices, co-vertices and the foci of the ellipse.

$$\frac{x^2}{36} + \frac{y^2}{16} = 1$$

**2** Given the information below, find the center, vertices, co-vertices and the foci of the ellipse.

$$\frac{(x-2)^2}{49} + \frac{(y+3)^2}{9} = 1$$

**3** Given the information below, find the center, vertices, co-vertices and the foci of the ellipse.

$$\frac{(x-5)^2}{100} + \frac{(y+1)^2}{36} = 1$$

**4** Given the information below, find the center, vertices, co-vertices and the foci of the ellipse.

**5** Given the information below, find the center, vertices, co-vertices and the foci of the ellipse.

**STATION 2: SATELLITE INTERSE**

Name: **Answer Key**

Directions: Graph each ellipse and identify the key features. Write the letter crosses through in the corresponding question number at the bottom to reveal the planet.

1.  $\frac{(x-2)^2}{25} + \frac{(y+1)^2}{4} = 1$

2.  $\frac{(x+3)^2}{16} + \frac{(y-3)^2}{36} = 1$

3.  $\frac{(x-1)^2}{16} + \frac{(y+2)^2}{25} = 1$

4.  $\frac{(x-1)^2}{4} + \frac{(y+2)^2}{25} = 1$

5.  $\frac{(x+1)^2}{36} + \frac{(y-3)^2}{16} = 1$

The \_\_\_\_\_ we live in is called \_\_\_\_\_

G	A	L	A
2	4	3	6

**STATION 1: ROCKET LAUNCH MATCH!**

Directions: At this station, you will identify a key feature of the given ellipse. You will then match the rocket ship question to the planet with your answer. Each correct match will reveal a letter, which you will use to unscramble a secret word.

Instructions:

- Start with any problem on the worksheet. Make sure to show your work!
- Once you get your answer, find it on the answer side of the page and draw a line from the question to the correct answer.
- Write down the letters from each correct answer.
- Use the hint to unscramble the letters to reveal the secret word.

The \_\_\_\_\_ we live in is called \_\_\_\_\_

**Planet Match:**

Center: (2, -1)	Center: (-4, 3)
Vertices: (-3, -1) & (7, -1)	Vertices: (-4, 4) & (-4, -3)
Co-vertices: (2, 2) & (2, -4)	Co-vertices: (0, 3) & (-8, 3)
Center: (1, -2)	Center: (-1, 3)
Vertices: (1, 3) & (1, -7)	Vertices: (5, 3) & (-7, 3)
Co-vertices: (3, -2) & (-1, -2)	Co-vertices: (-1, 7) & (-1, -1)

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This is a great activity to use when reviewing for an end of unit assessment on **conic sections and ellipses** or as an end of year review.



hey there!

My name is Malia and I'm passionate about making learning and practicing math fun. I love creating engaging math resources for my students and I hope your students enjoy this activity too!

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