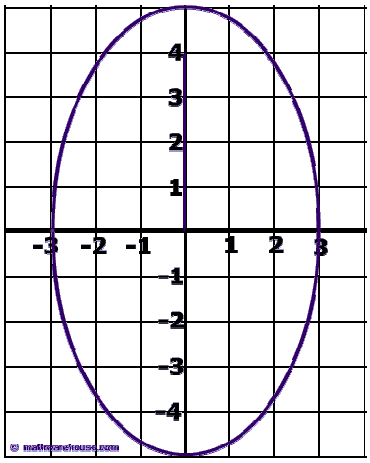
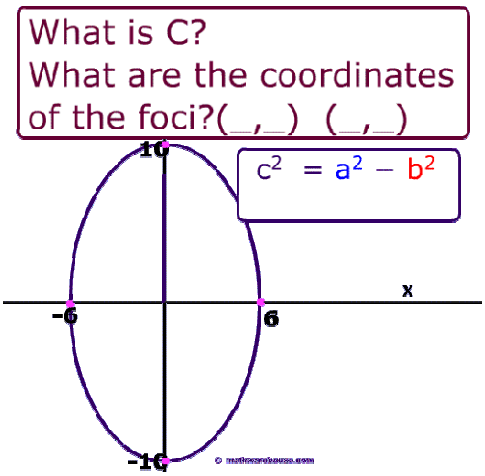
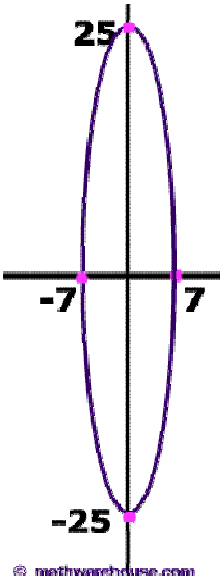
The Focus of an Ellipse

Lesson online @ www.mathwarehouse.com/ellipse/focus-of-ellipse.php

What is C in the equation below?
What are the coordinates of the two foci?







C:_____

Foci (,) & (,)

C:_____

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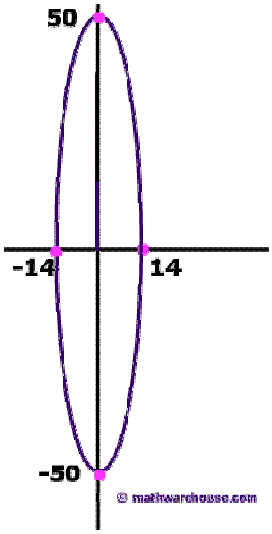
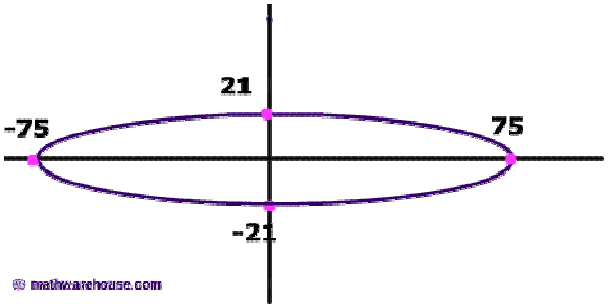
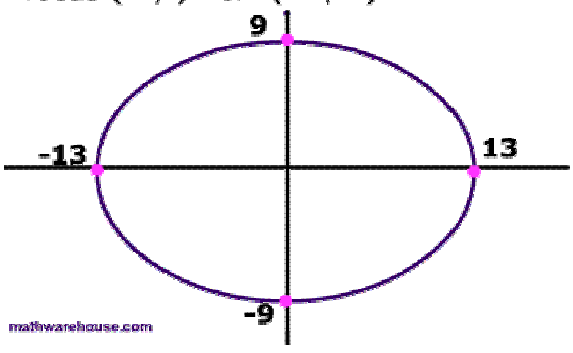




C:____
focus (,) & (,)



Part II. Determine the value of c and the coordinates of the foci for each ellipse below.

1) $25x^2 + 9y^2 = 225$

2) $100x^2 + 36y^2 = 3{,}600$

3) $25X^2 + 4y^2 = 100$

4) $64X^2 + 9y^2 = 576$

5) $25X^2 + 36y^2 = 900$

6) $625X^2 + 576y^2 = 360{,}000$

Analysis

How many foci does a circle have? Use the example of the circle below to help you find the answer

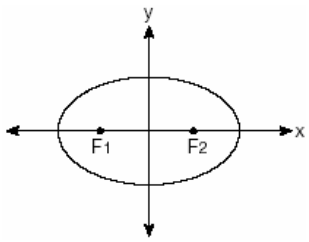
$X^2 + Y^2 = 9$

7) $5X^2 + 20y^2 = 100$

8) $2X^2 + 3y^2 = 6$

New York Math B Regents Problems involving Ellipses:

1. The accompanying diagram shows the elliptical orbit of a planet. The foci of the elliptical orbit are F_1 and F_2.

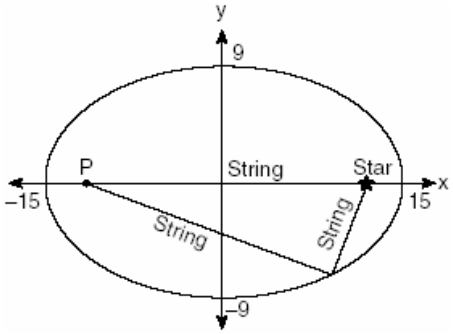


If *a*, *b*, and *c* are all positive and $a \neq b \neq c$, which equation could represent the path of the planet?

(1) $ax^2 - by^2 = c^2$ (3) $y = ax^2 + c^2$

(2) $ax^2 + by^2 = c^2$ (4) $x^2 + y^2 = c^2$

2. The accompanying diagram shows the construction of a model of an elliptical orbit of a planet traveling around a star. Point *P* and the center of the star represent the foci of the orbit.



Which equation could represent the relation shown?

(1) $\frac{x^2}{81} + \frac{y^2}{225} = 1$ (3) $\frac{x^2}{15} + \frac{y^2}{9} = 1$

(2) $\frac{x^2}{225} + \frac{y^2}{81} = 1$ (4) $\frac{x^2}{15} - \frac{y^2}{9} = 1$

3. Which equation, when graphed on a Cartesian coordinate plane, would best represent an elliptical racetrack?

(1) $3x^2 + 10y^2 = 288{,}000$ (3) $3x + 10y = 288{,}000$

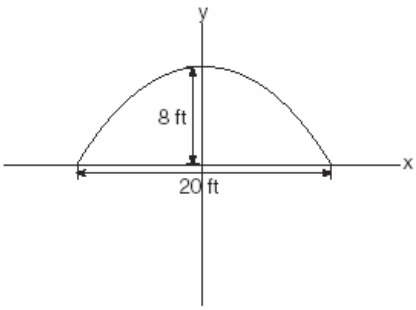
(2) $3x^2 - 10y^2 = 288{,}000$ (4) $30xy = 288{,}000$

4. A commercial artist plans to include an ellipse in a design and wants the length of the horizontal axis to equal 10 and the length of the vertical axis to equal 6. Which equation could represent this ellipse?

(1) $9x^2 + 25y^2 = 225$ (3) $x^2 + y^2 = 100$

(2) $9x^2 - 25y^2 = 225$ (4) $3y = 20x^2$

5. An architect is designing a building to include an arch in the shape of a semi-ellipse (half an ellipse), such that the width of the arch is 20 feet and the height of the arch is 8 feet, as shown in the accompanying diagram.



Which equation models this arch?

(1) $\frac{x^2}{100}+\frac{y^2}{64}=1$

(2) $\frac{x^2}{400}+\frac{y^2}{64}=1$

(3) $\frac{x^2}{64}+\frac{y^2}{100}=1$

(4) $\frac{x^2}{64}+\frac{y^2}{400}=1$