

Precalc 10.5

Use and determine standard and general forms of the equation of a parabola

Graph parabolas

focus

directrix

axis of symmetry

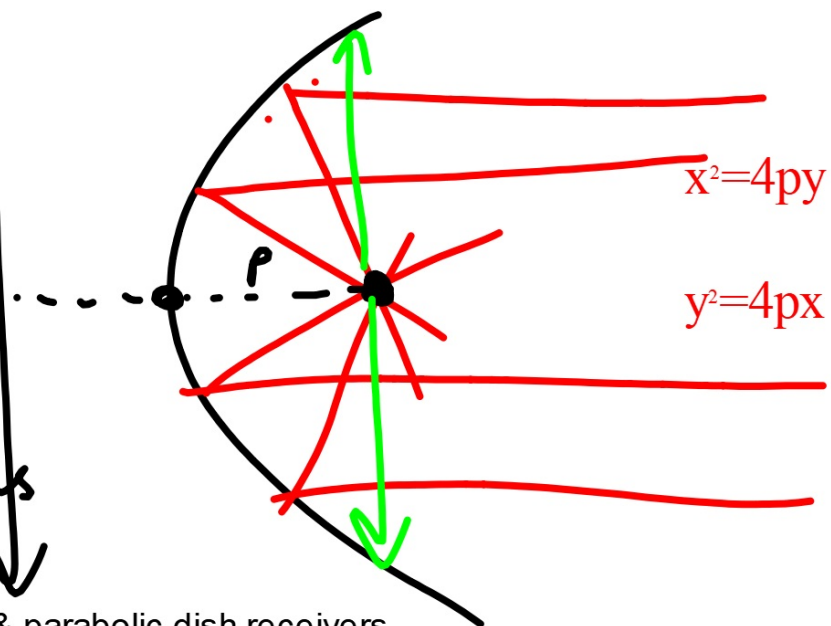
vertex

latus rectum

width @ focus

eccentricity

Parabolic reflectors & parabolic dish receivers



$$y^2 = 4px$$

For the equation of each parabola, find the coordinates of the vertex and focus, and the equations of the directrix and axis of symmetry. Then graph the equation.

6. $x^2 = 12(y - 1)$

7. $y^2 - 4x + 2y + 5 = 0$

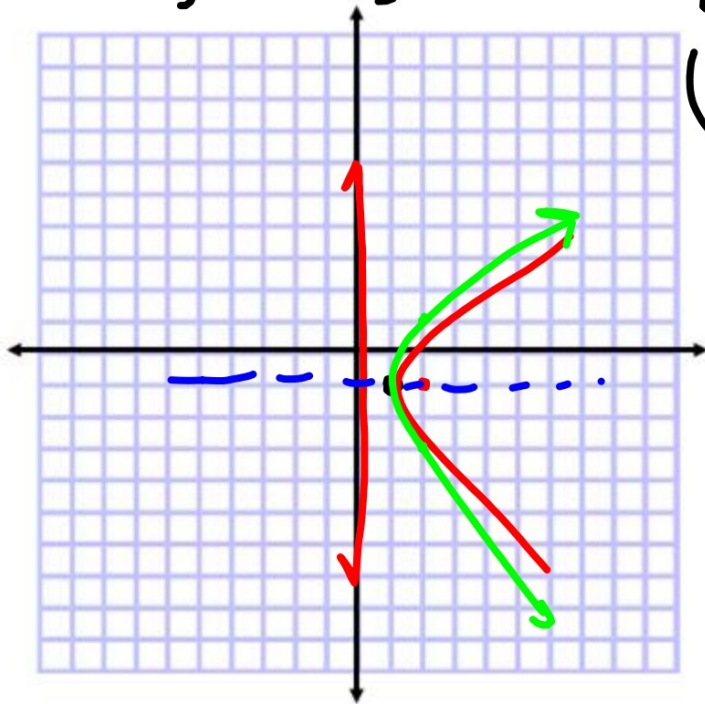
8. $x^2 + 8x + 4y + 8 = 0$

Complete the square
Sketch graph ASAP
Final graph later

LR = 4p

$$y^2 + 2y + 1 = 4x - 5 + 1$$

$$(y+1)^2 = 4(x-1)$$



$$4 = 4p$$

$$\frac{4}{4} = \frac{4p}{4}$$

$$p = 1$$

$$LR = 4p = 4$$

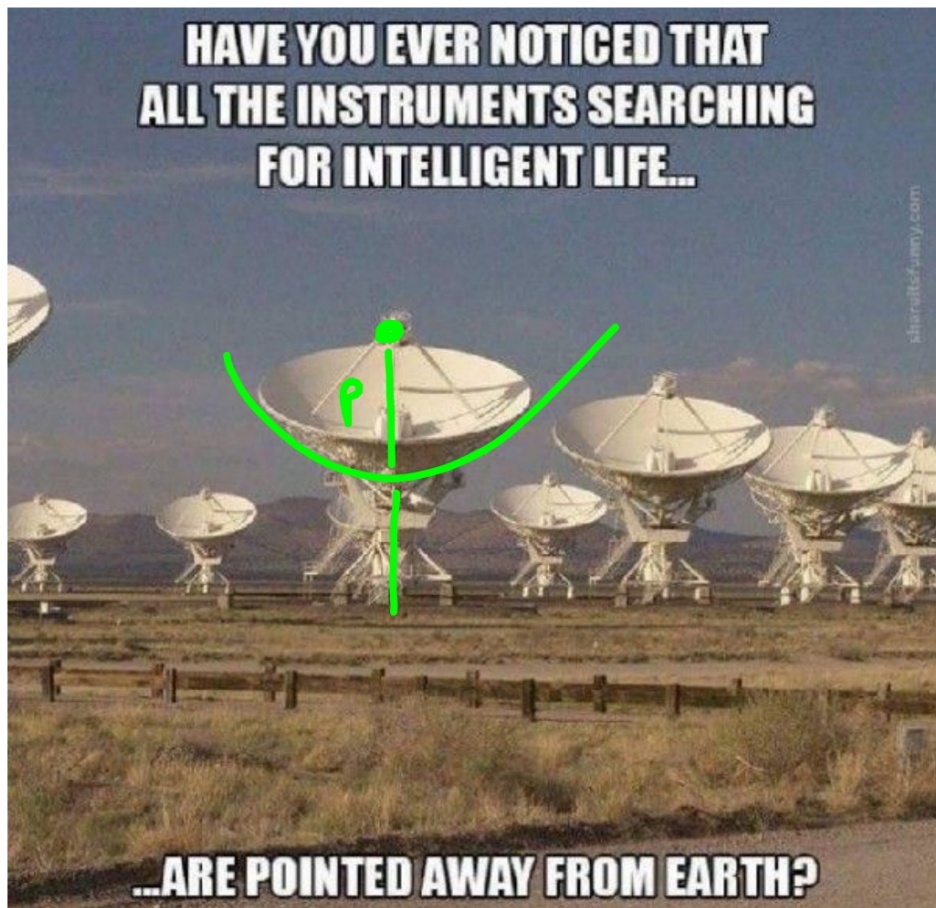
$$V(1, -1) \quad F(2, -1)$$

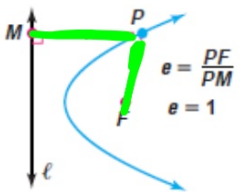
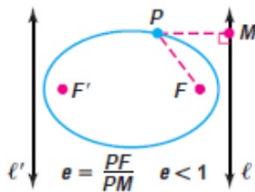
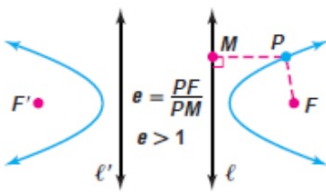
$$\text{dir } x=0 \text{ Axis } y=-1$$

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ALL THE INSTRUMENTS SEARCHING
FOR INTELLIGENT LIFE...**

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...ARE POINTED AWAY FROM EARTH?



parabola	ellipse	hyperbola
$e = 1$	$e < 1, e \neq 0$	$e > 1$
 $e = \frac{PF}{PM}$ $e = 1$	 $e = \frac{PF}{PM}$ $e < 1$	 $e = \frac{PF}{PM}$ $e > 1$

SE

Write the equation of the parabola that meets each set of conditions. Then graph the equation.

9. The vertex is at the origin, and the focus is at $(0, -4)$.

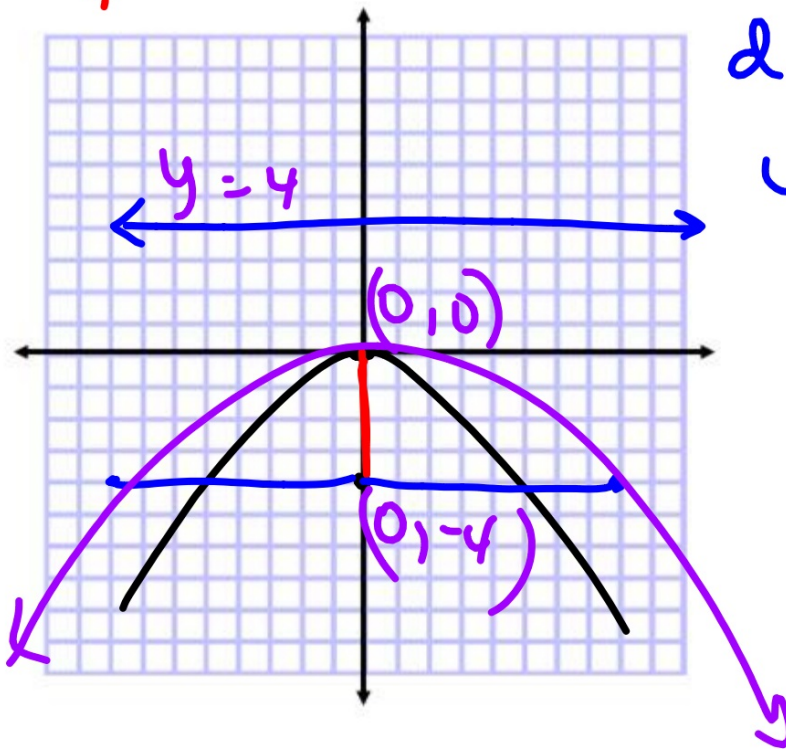
$$x^2 = 4py$$

4

$$(x-0)^2 = 16(y-0)$$

$$\text{dir } y = -4$$

$$4p = 16$$



10. The parabola passes through the point at $(2, -1)$, has its vertex at $(-7, 5)$, and opens to the right.

$$(y-5)^2 = 4(x+7)$$

$$F(-6, 5)$$

$$x = -7$$

$$4p = 4$$

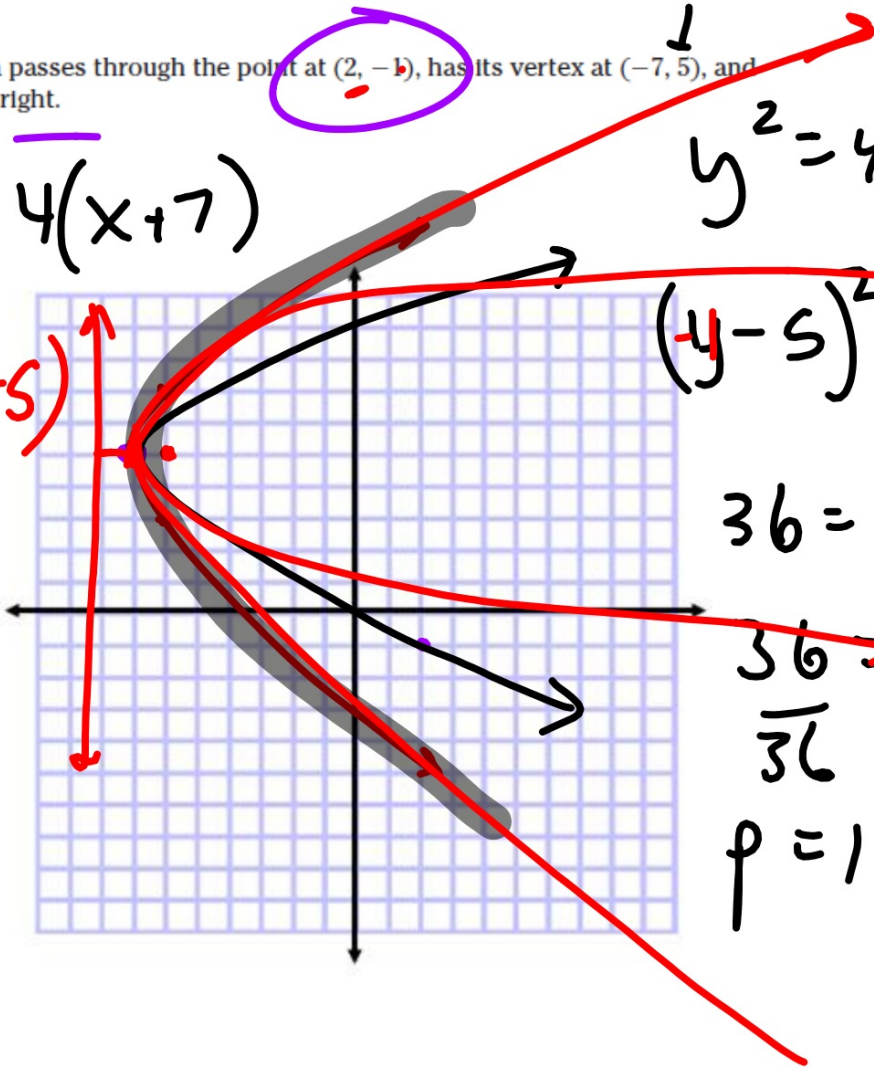
$$y^2 = 4px$$

$$(-1-5)^2 = 4p(2+7)$$

$$36 = 4p(9)$$

$$\frac{36}{36} = \frac{36p}{36}$$

$$p = 1$$



$$e = \frac{c}{a} = 1$$