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INSTRUCTOR

**Christiaan Ketelaar**  
Universidad Francisco Marroquin

## 10.1 Ecuaciones Paramétricas (Homework)

### Current Score

QUESTION

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

POINTS

-1/2

-1/2

-1/2

-1/2

-1/2

-1/2

-1/2

-1/2

-1/2

-1/0

-1/0

-1/2

-1/2

-1/2

-1/2

TOTAL SCORE

-1/26

0.0%



### Due Date

**DECEMBER 21**  
**11:59 PM CST**

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## Assignment Submission & Scoring

### Assignment Submission

For this assignment, you submit answers by question parts. The number of submissions remaining for each question part only changes if you submit or change the answer.

### Assignment Scoring

Your last submission is used for your score.

1. **-/2 points** WebAssignCalcET2 9.1.002m.Tut.

[My Notes](#)[Ask Your Teacher](#)

A bullet follows the trajectory  $c(t) = (60t, 600t - 16t^2)$ . Show that the path traced by the bullet is a parabola by eliminating the parameter.

$y =$

2. **-/2 points** WebAssignCalcET2 9.1.002n.Tut. [My Notes](#)[Ask Your Teacher](#)

Parameterize the given curve.

$$(x + 9)^2 + (y - 6)^2 = 16$$

 $c(t) = ($  $)$

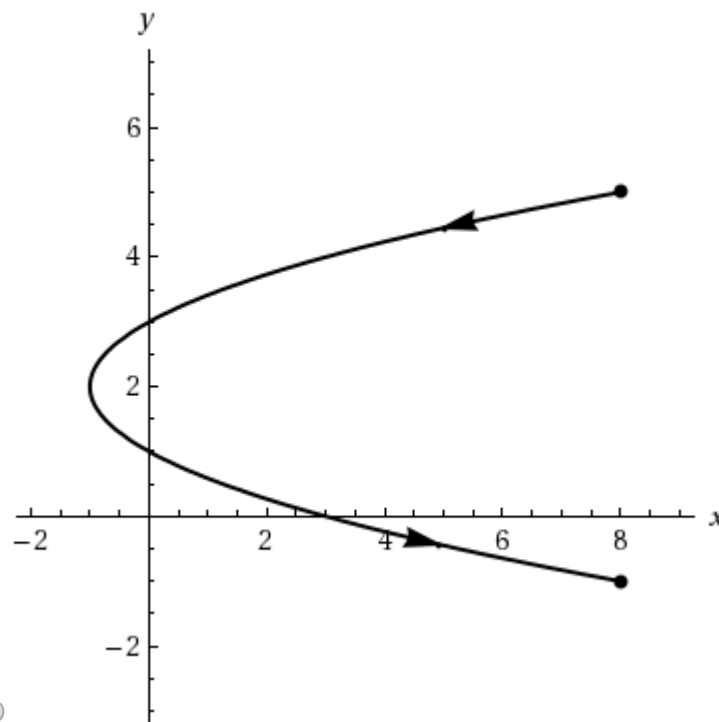
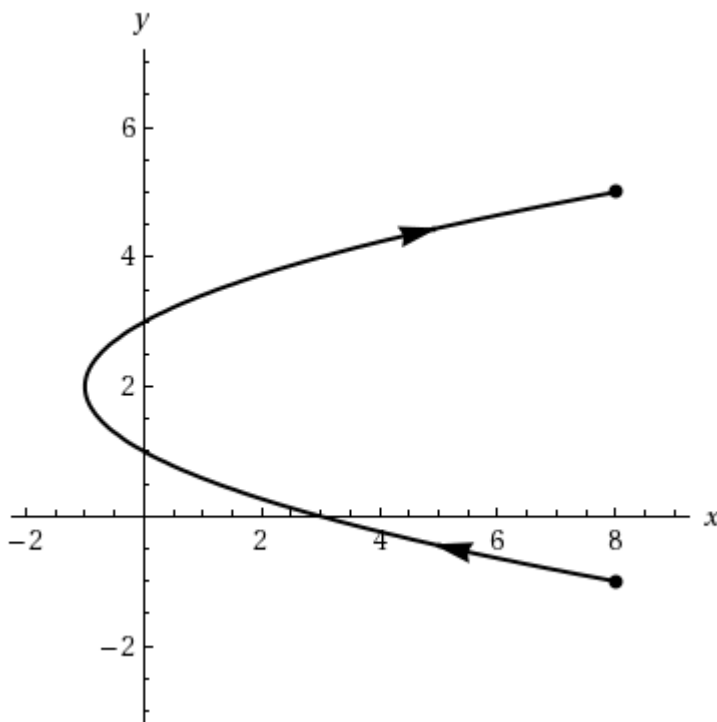
3. -/2 points SCalcET8 10.1.007.

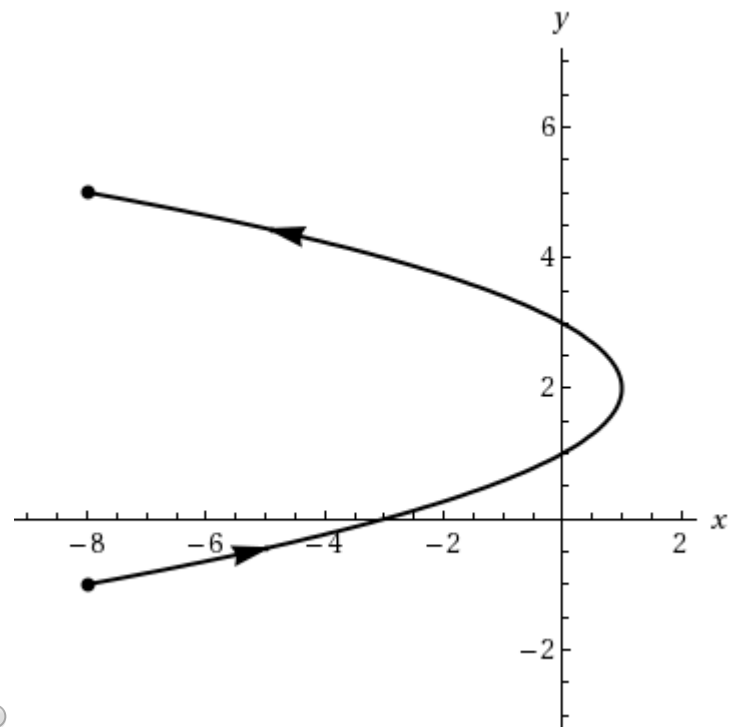
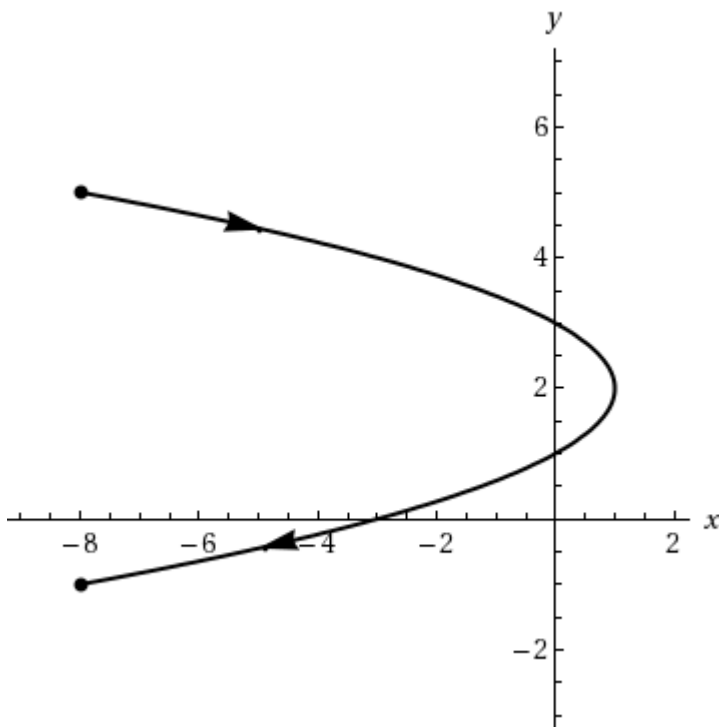
[My Notes](#)[Ask Your Teacher](#)

Consider the parametric equations below.

$$x = t^2 - 1, \quad y = t + 2, \quad -3 \leq t \leq 3$$

(a) Sketch the curve by using the parametric equations to plot points. Indicate with an arrow the direction in which the curve is traced as  $t$  increases.





(b) Eliminate the parameter to find a Cartesian equation of the curve.

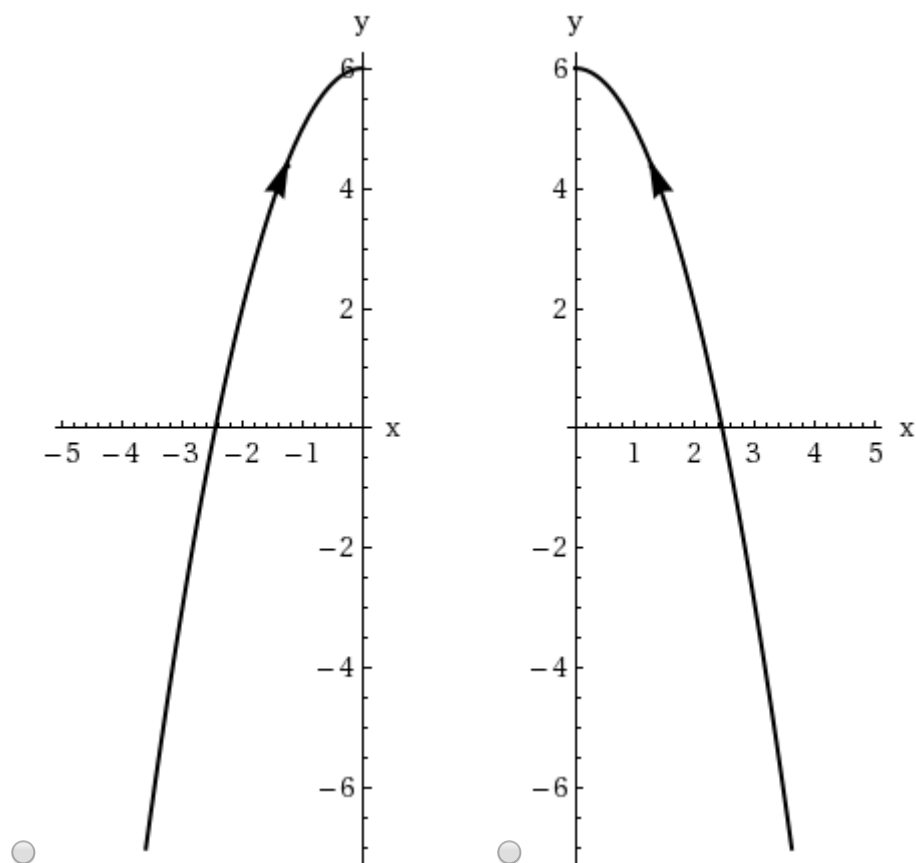
for  $-1 \leq y \leq 5$

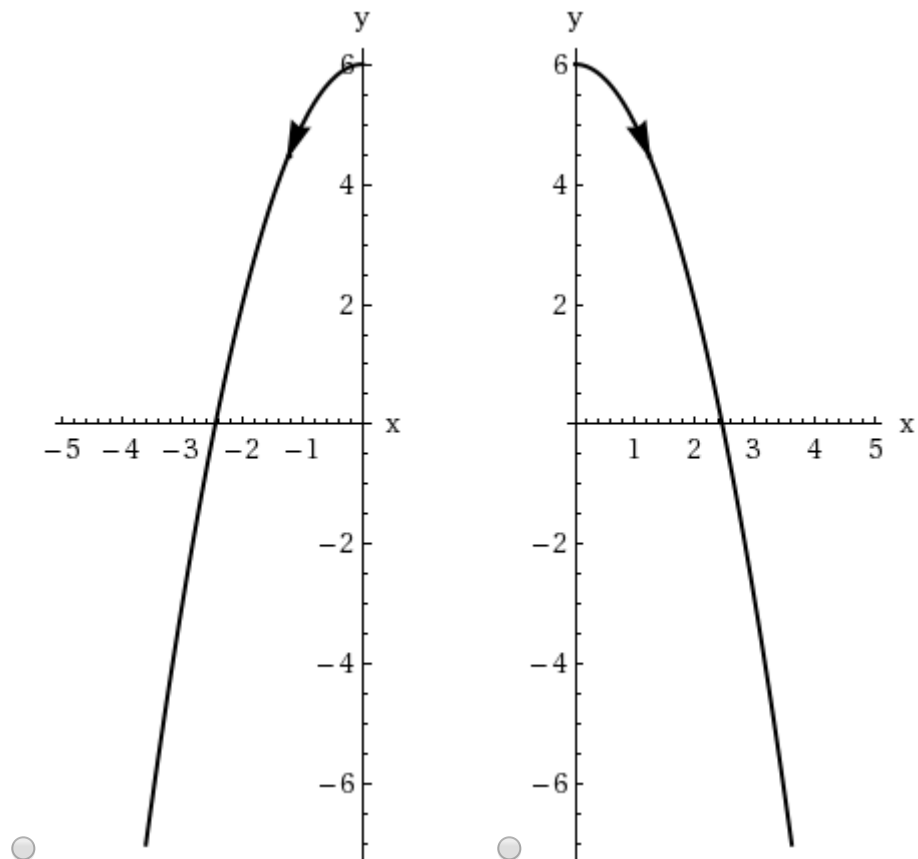
4. **-/2 points** SCalcET8 10.1.009.[My Notes](#)[Ask Your Teacher](#)

Consider the parametric equations below.

$$x = \sqrt{t}, \quad y = 6 - t$$

(a) Sketch the curve by using the parametric equations to plot points. Indicate with an arrow the direction in which the curve is traced as  $t$  increases.





(b) Eliminate the parameter to find a Cartesian equation of the curve.

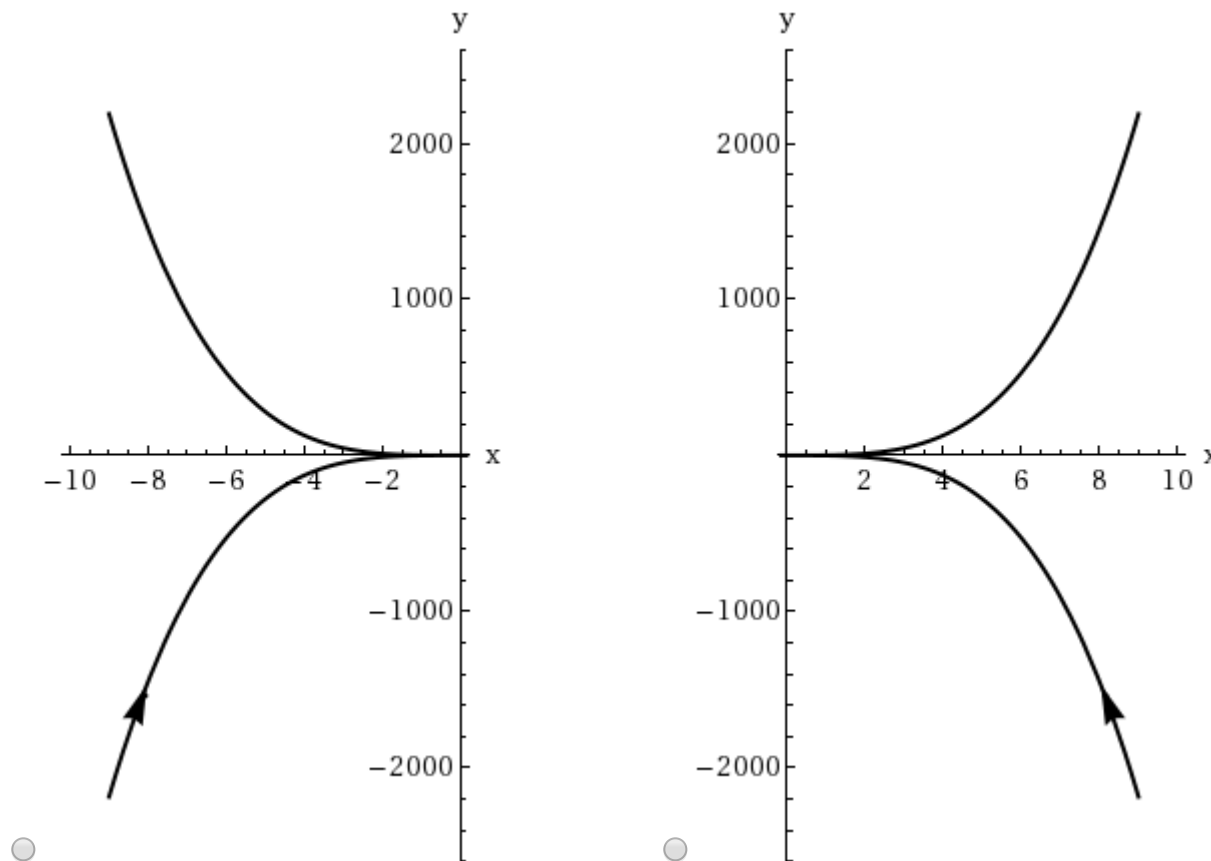
for  $x \geq 0$

5. **-/2 points** SCalcET8 10.1.010.[My Notes](#)[Ask Your Teacher](#)

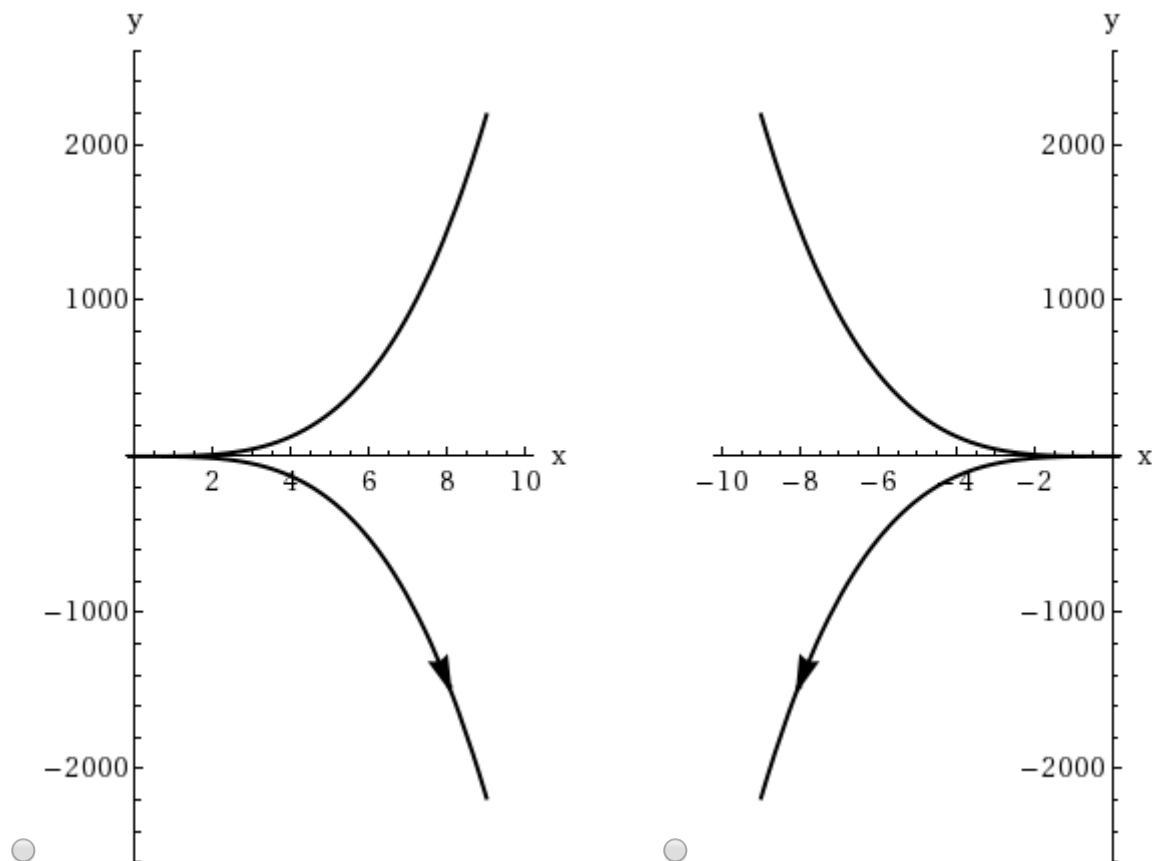
Consider the parametric equations below.

$$x = t^2, \quad y = t^7$$

(a) Sketch the curve by using the parametric equations to plot points. Indicate with an arrow the direction in which the curve is traced as  $t$  increases.







(b) Eliminate the parameter to find a Cartesian equation of the curve.

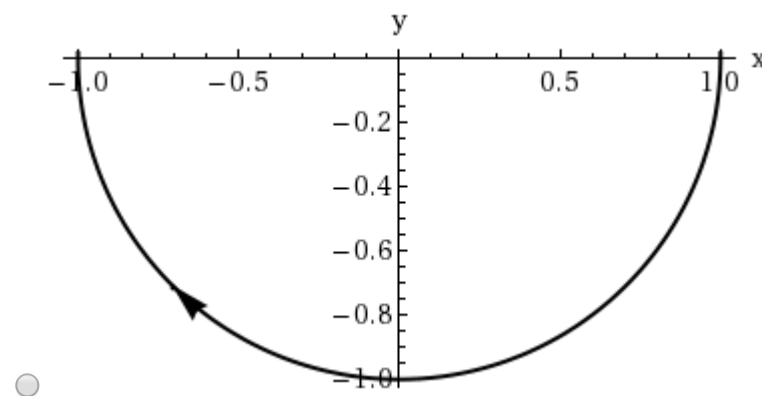
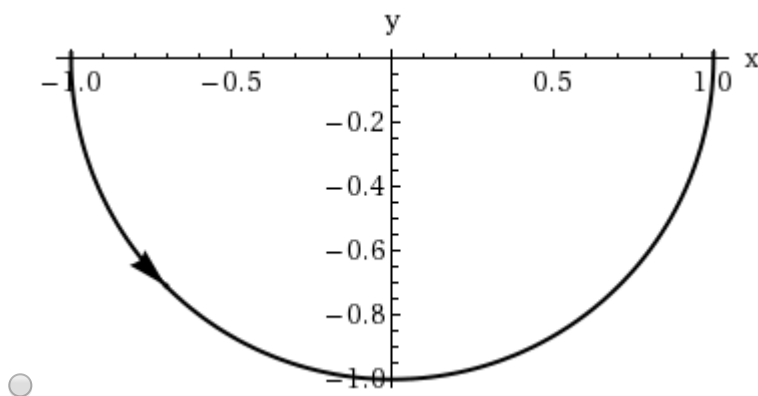
6. **-/2 points** SCalcET8 10.1.011.[My Notes](#)[Ask Your Teacher](#)

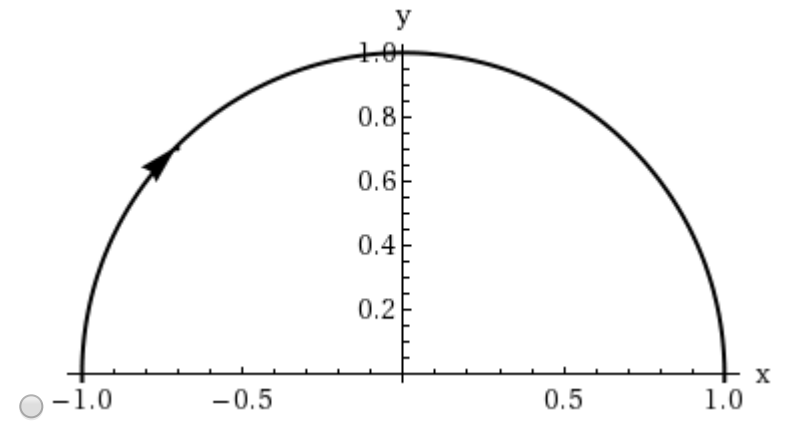
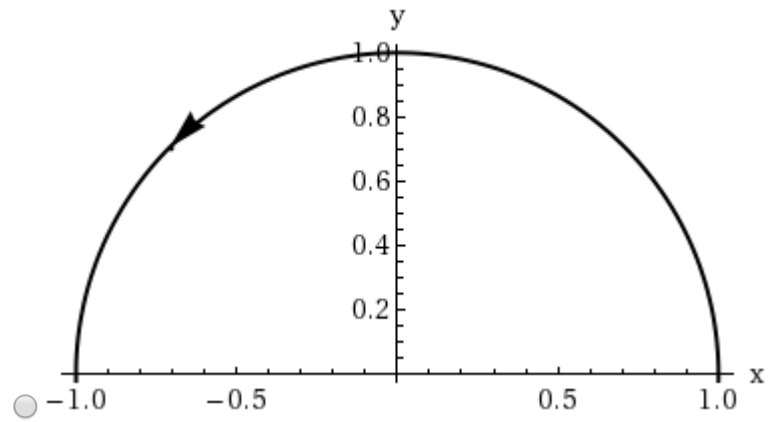
Consider the following.

$$x = \sin\left(\frac{1}{2}\theta\right), \quad y = \cos\left(\frac{1}{2}\theta\right), \quad -\pi \leq \theta \leq \pi$$

(a) Eliminate the parameter to find a Cartesian equation of the curve.

(b) Sketch the curve and indicate with an arrow the direction in which the curve is traced as the parameter increases.





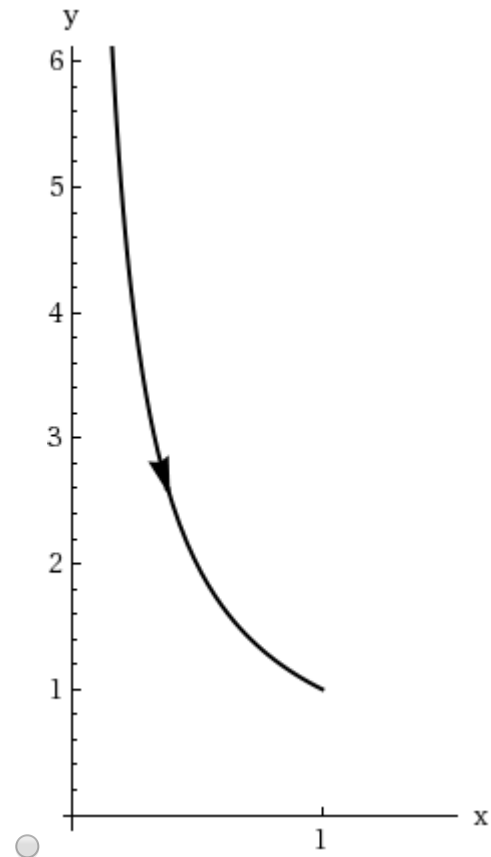
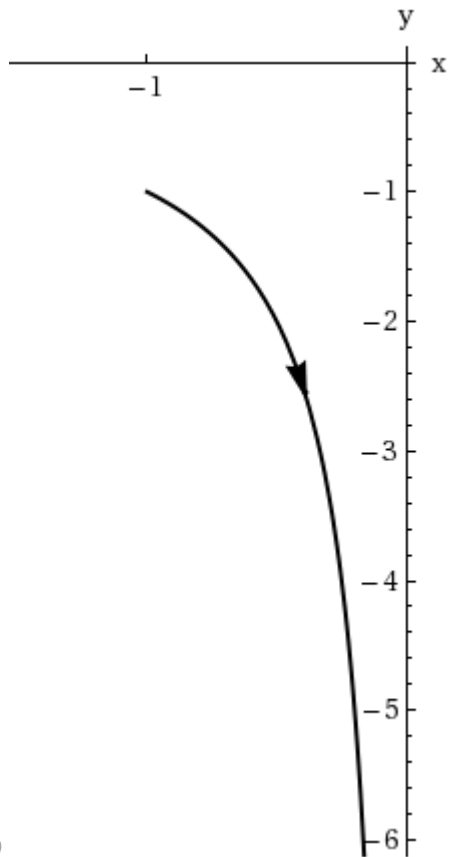
7. **-/2 points** SCalcET8 10.1.013. [My Notes](#)[Ask Your Teacher](#)

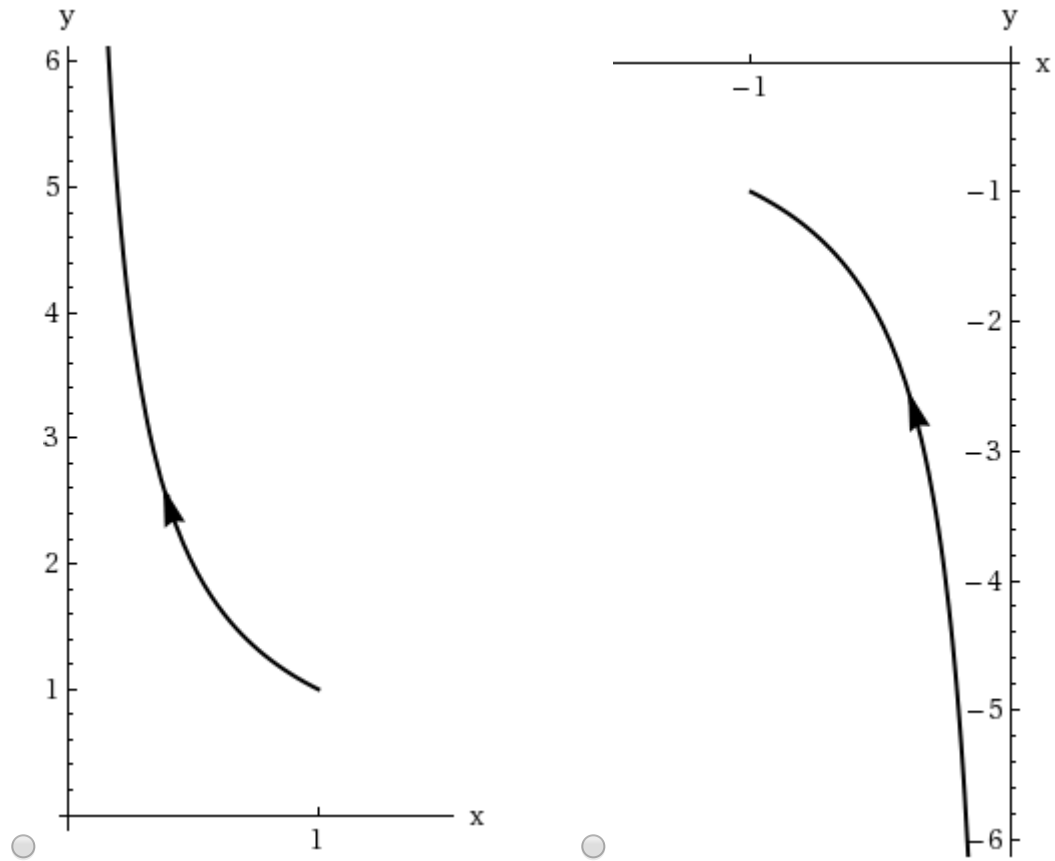
Consider the following.

$$x = \sin(t), \quad y = \csc(t), \quad 0 < t < \pi/2$$

(a) Eliminate the parameter to find a Cartesian equation of the curve.

(b) Sketch the curve and indicate with an arrow the direction in which the curve is traced as the parameter increases.





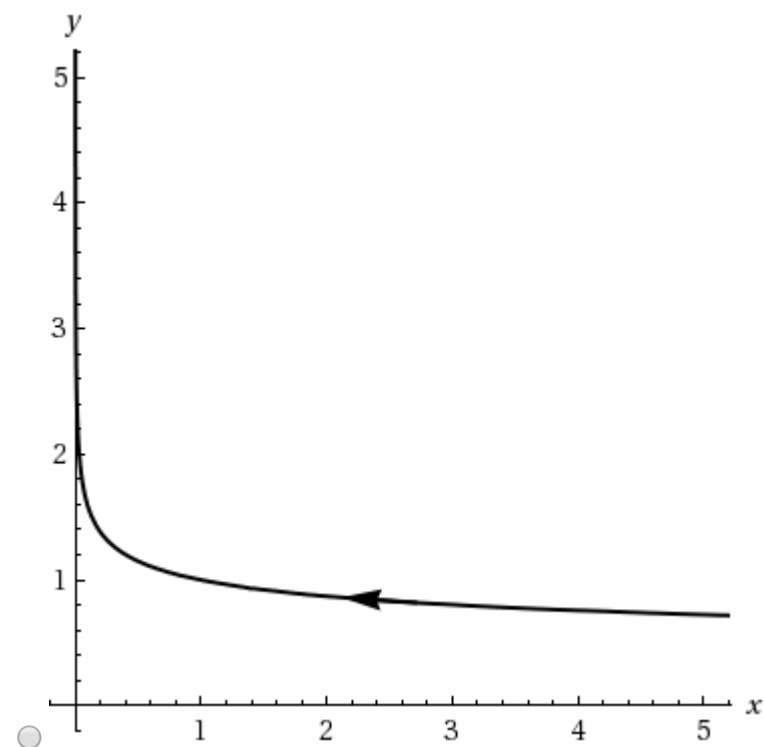
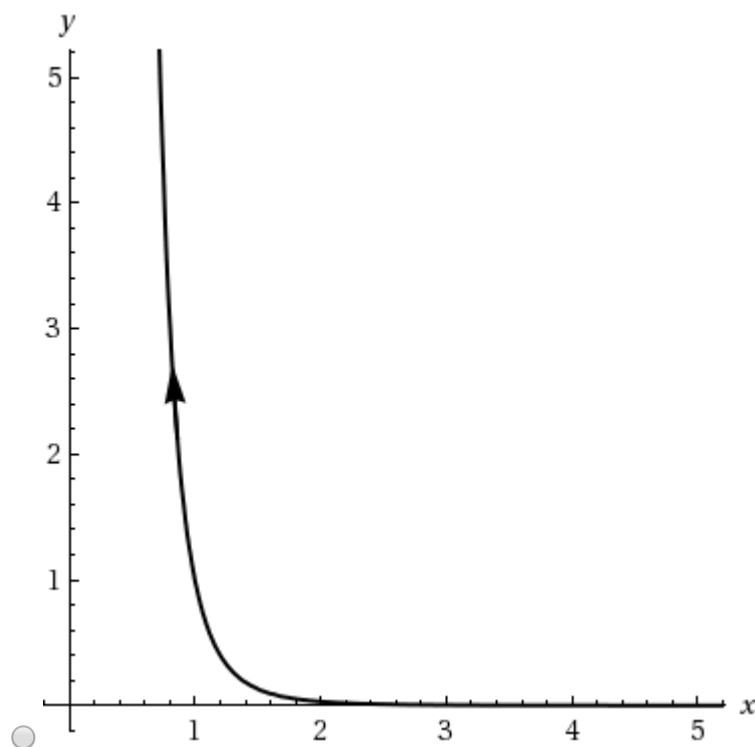
8. **-/2 points** SCalcET8 10.1.014.[My Notes](#)[Ask Your Teacher](#)

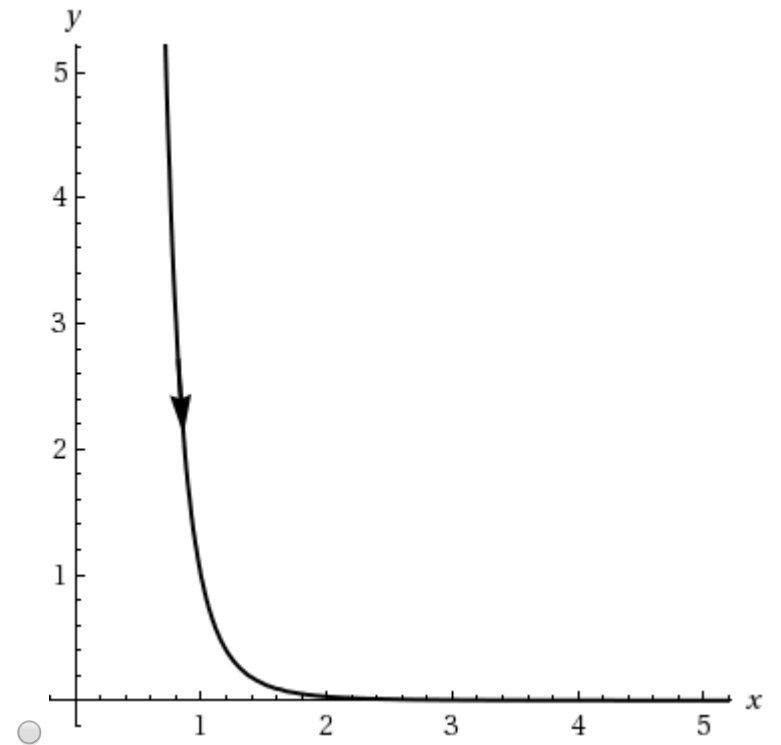
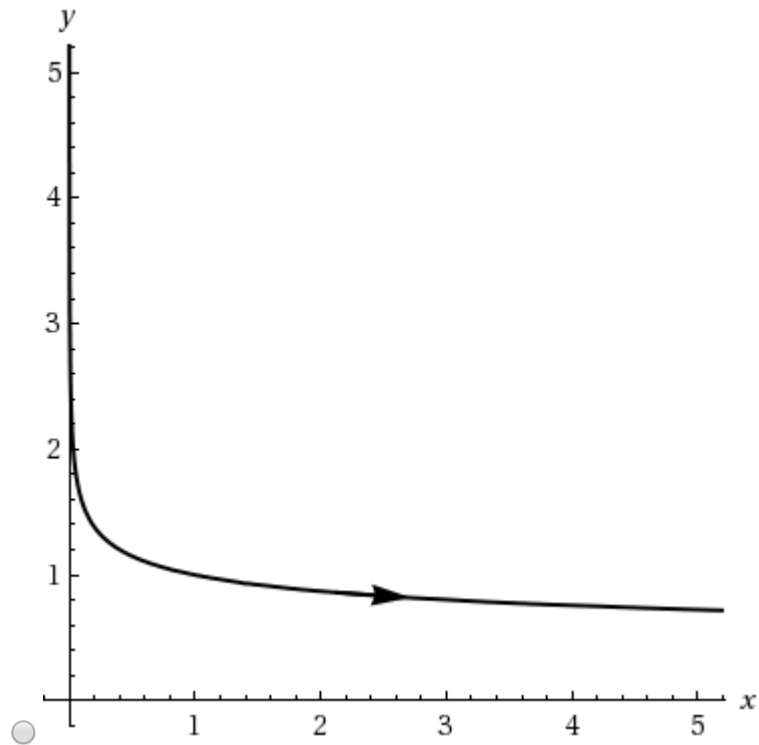
Consider the following.

$$x = e^t, \quad y = e^{-5t}$$

(a) Eliminate the parameter to find a Cartesian equation of the curve.

(b) Sketch the curve and indicate with an arrow the direction in which the curve is traced as the parameter increases.







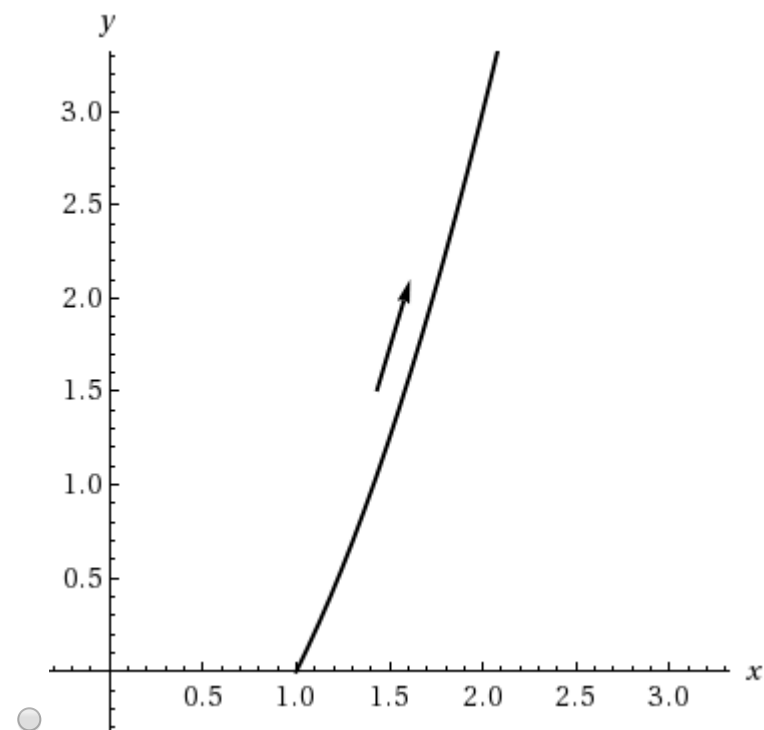
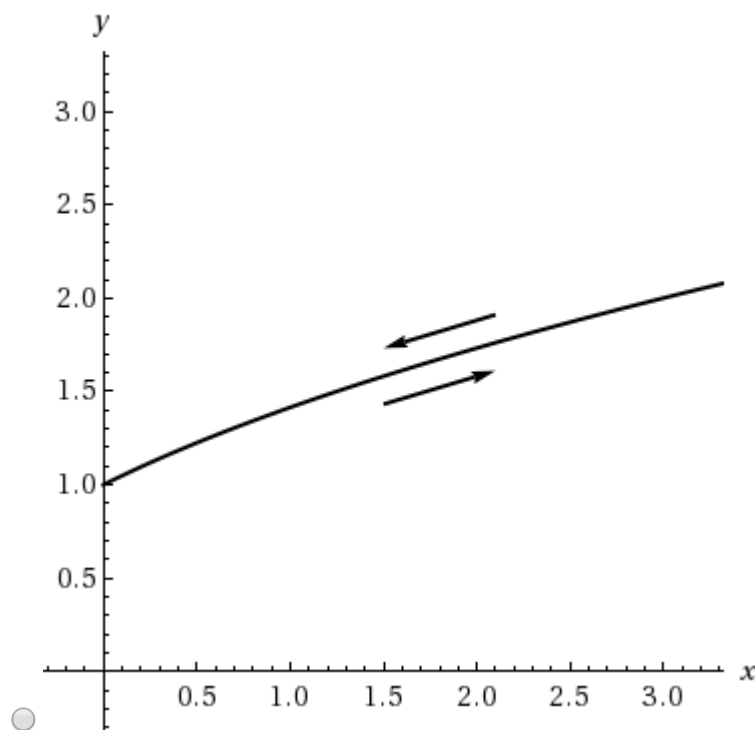
9. **-/2 points** SCalcET8 10.1.018.[My Notes](#)[Ask Your Teacher](#)

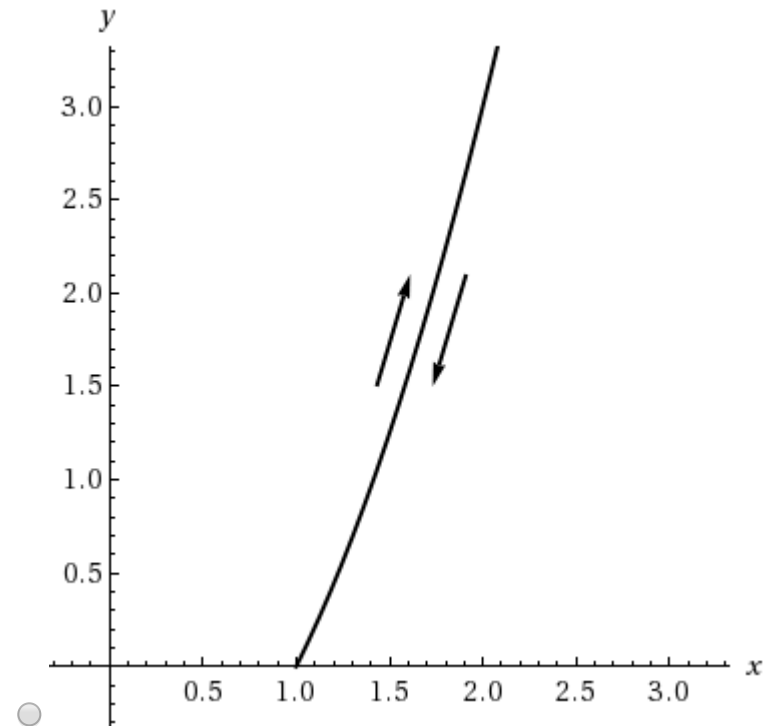
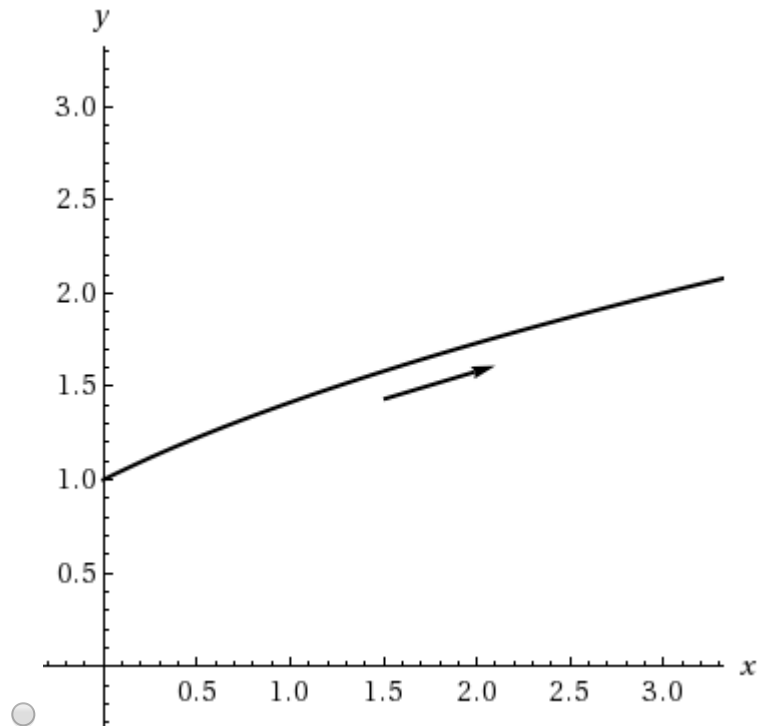
Consider the following.

$$x = \tan^2(\theta), \quad y = \sec(\theta), \quad -\pi/2 < \theta < \pi/2$$

(a) Eliminate the parameter to find a Cartesian equation of the curve.

(b) Sketch the curve and indicate with an arrow the direction in which the curve is traced as the parameter increases.





10.

-/0 points

SCalcET8 10.1.033.

 My Notes[Ask Your Teacher](#)

Find parametric equations for the path of a particle that moves along the circle  $x^2 + (y - 1)^2 = 4$  in the manner described. (Enter your answer as a comma-separated list of equations. Let  $x$  and  $y$  be in terms of  $t$ .)

(a) Once around clockwise, starting at  $(2, 1)$ .  $0 \leq t \leq 2\pi$ .

(b) Four times around counterclockwise, starting at  $(2, 1)$ .  $0 \leq t \leq 8\pi$ .

(c) Halfway around counterclockwise, starting at  $(0, 3)$ .  $0 \leq t \leq \pi$ .

11. -/0 points SCalcET8 10.1.046.

[My Notes](#)[Ask Your Teacher](#)

If a projectile is fired with an initial velocity of  $v_0$  meters per second at an angle  $\alpha$  above the horizontal and air resistance is assumed to be negligible, then its position after  $t$  seconds is given by the parametric equations

$$x = (v_0 \cos(\alpha))t \quad y = (v_0 \sin(\alpha))t - \frac{1}{2}gt^2$$

where  $g$  is the acceleration due to gravity ( $9.8 \text{ m/s}^2$ ). (Round your answers to the nearest whole number.)

(a) If a gun is fired with  $\alpha = 30^\circ$  and  $v_0 = 600 \text{ m/s}$ . When will the bullet hit the ground?

 s

How far from the gun will it hit the ground?

 m

What is the maximum height reached by the bullet?

 m

(b) Find the equation of the parabolic path by eliminating the parameter.

12. -/2 points SCalcET8 10.1.502.XP.

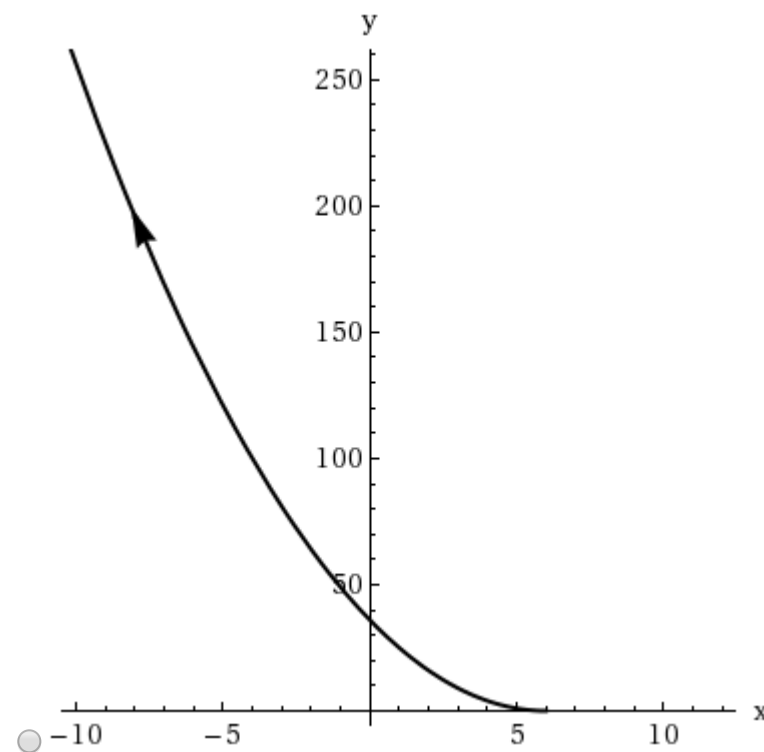
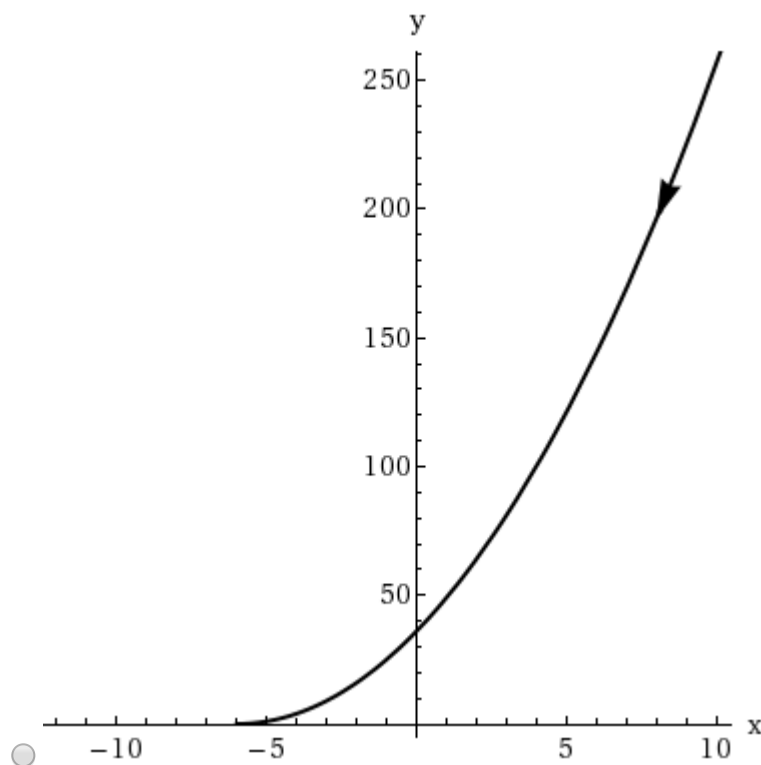
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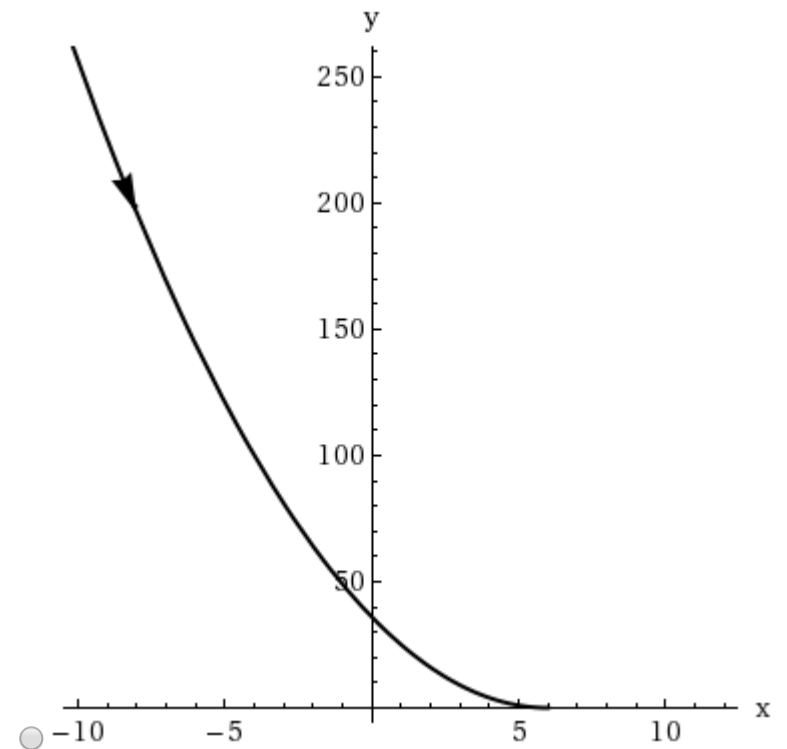
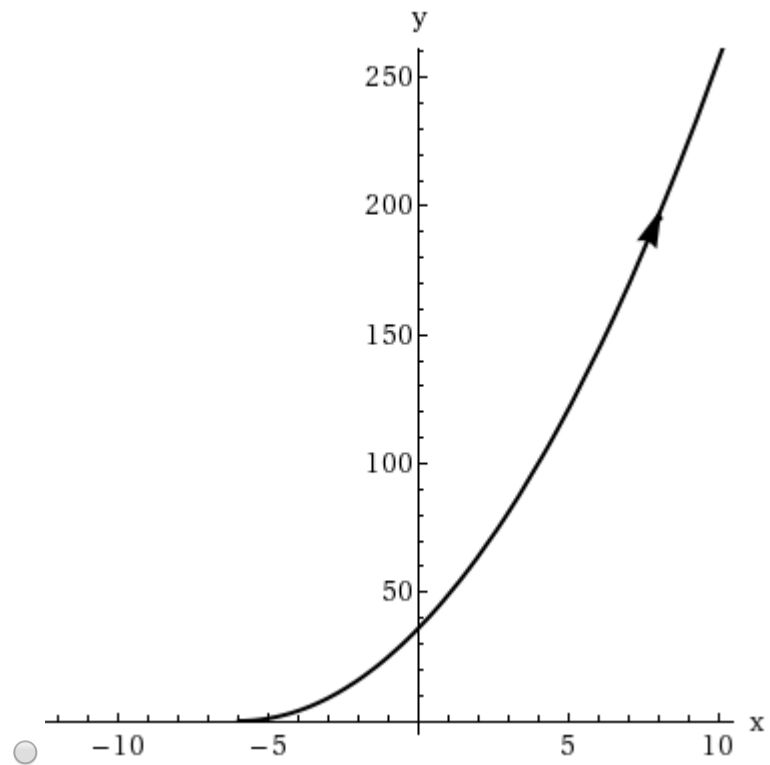
Consider the following.

$$x = e^t - 6, \quad y = e^{2t}$$

(a) Eliminate the parameter to find a Cartesian equation of the curve.

(b) Sketch the curve and indicate with an arrow the direction in which the curve is traced as the parameter increases.





13.

-2 points

SCalcET8 10.1.512.XP.MI.

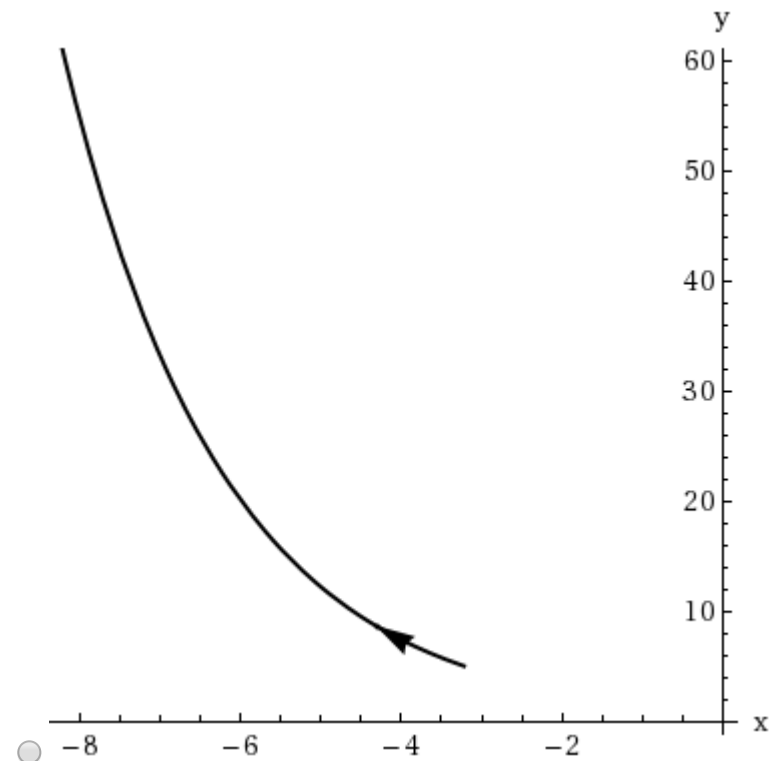
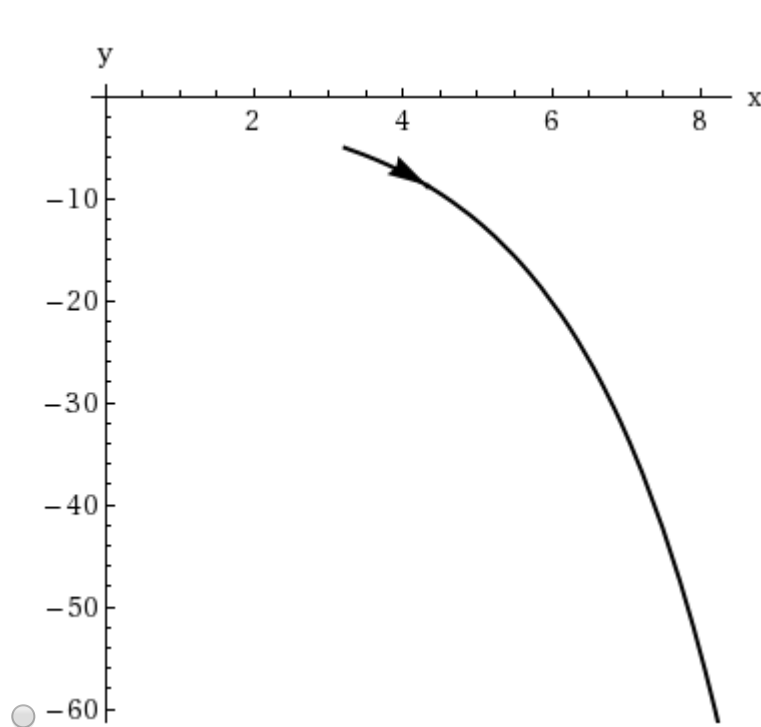
 My Notes[Ask Your Teacher](#)

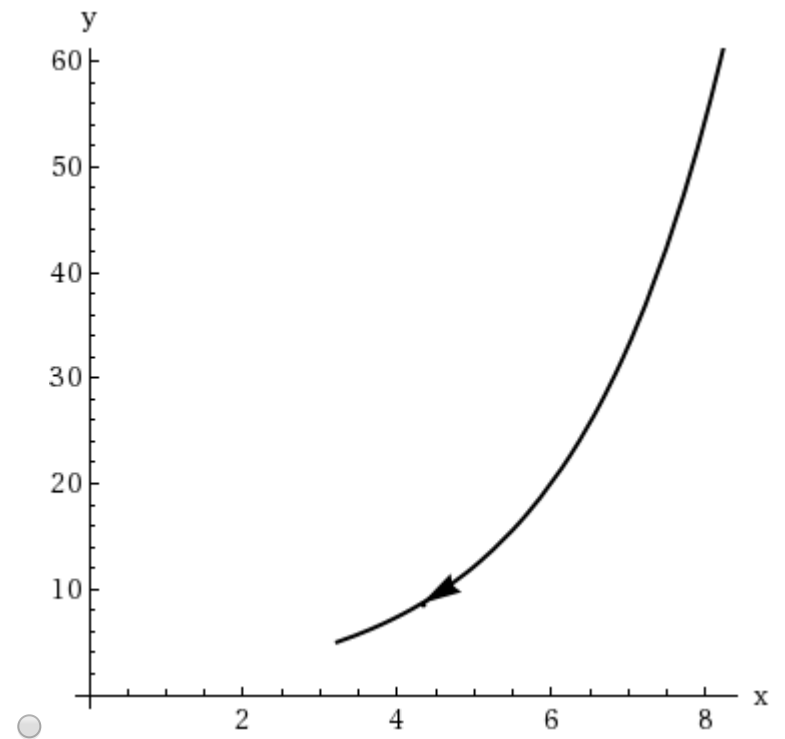
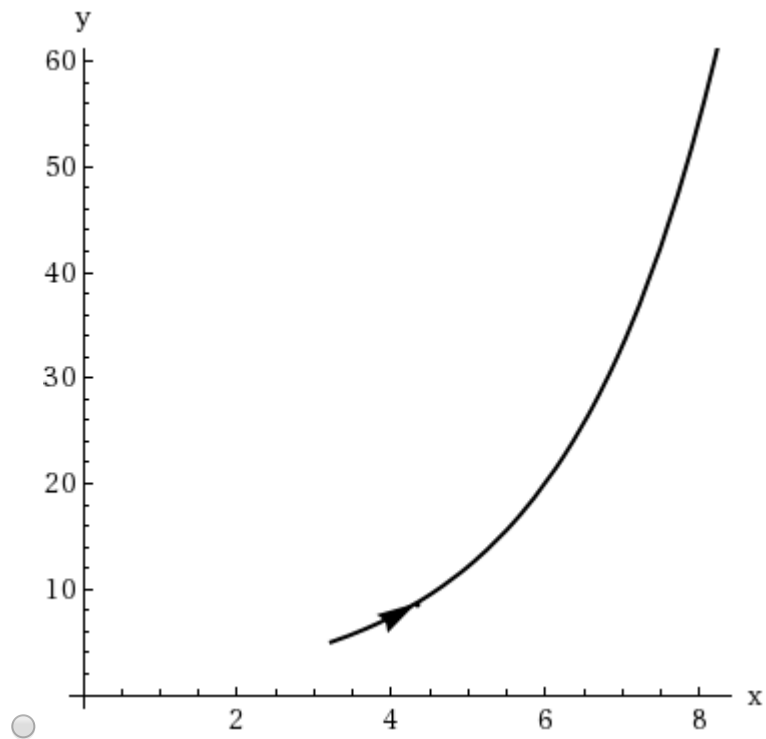
Consider the following.

$$x = \ln(t), \quad y = \sqrt{t}, \quad t \geq 25$$

(a) Eliminate the parameter to find a Cartesian equation of the curve.

(b) Sketch the curve and indicate with an arrow the direction in which the curve is traced as the parameter increases.







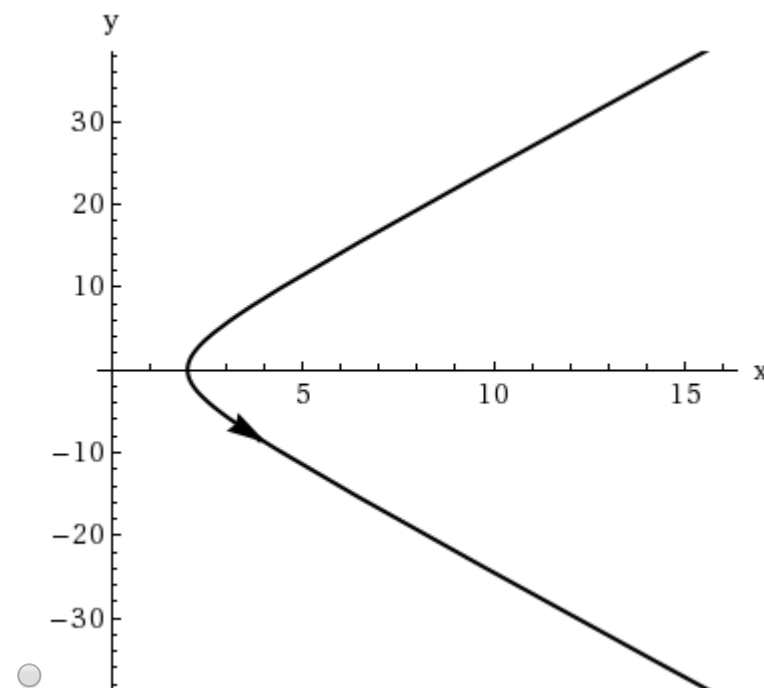
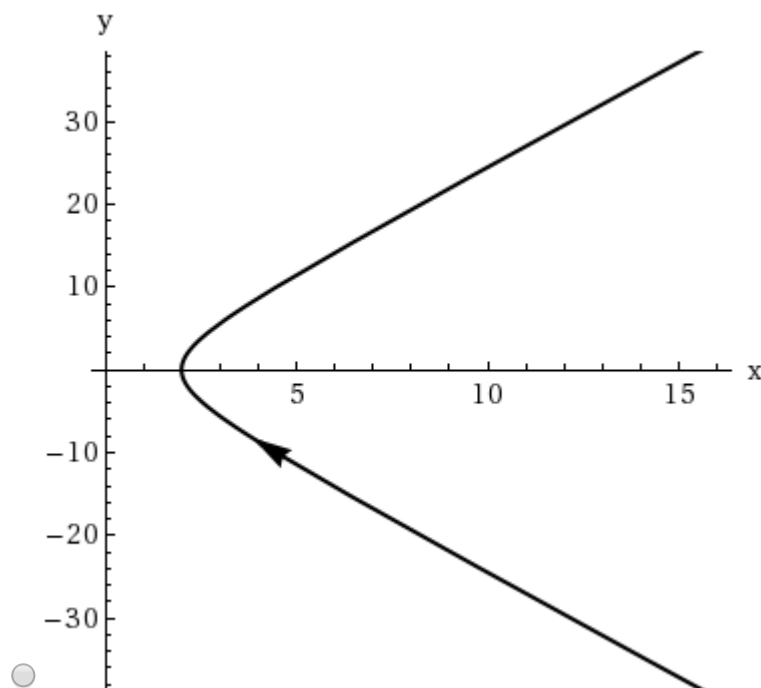
14. **-/2 points** SCalcET8 10.1.513.XP.[My Notes](#)[Ask Your Teacher](#)

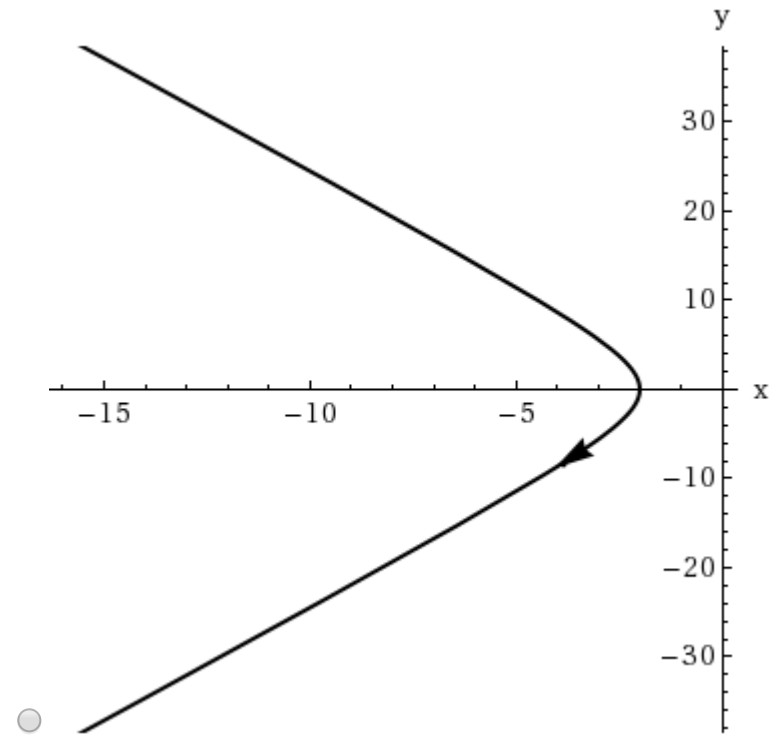
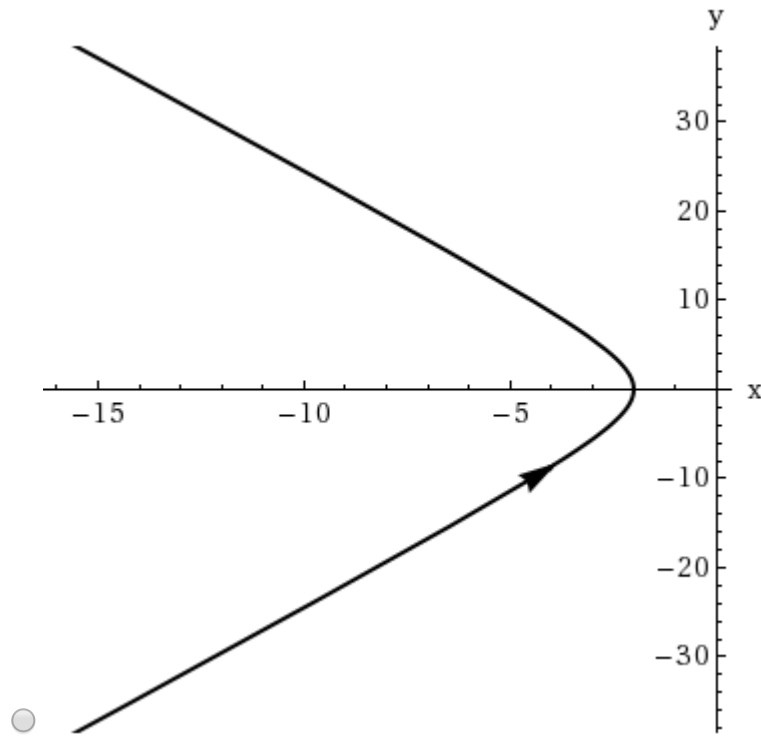
Consider the following.

$$x = 2 \cosh(t), \quad y = 5 \sinh(t)$$

(a) Eliminate the parameter to find a Cartesian equation of the curve.

(b) Sketch the curve and indicate with an arrow the direction in which the curve is traced as the parameter increases.

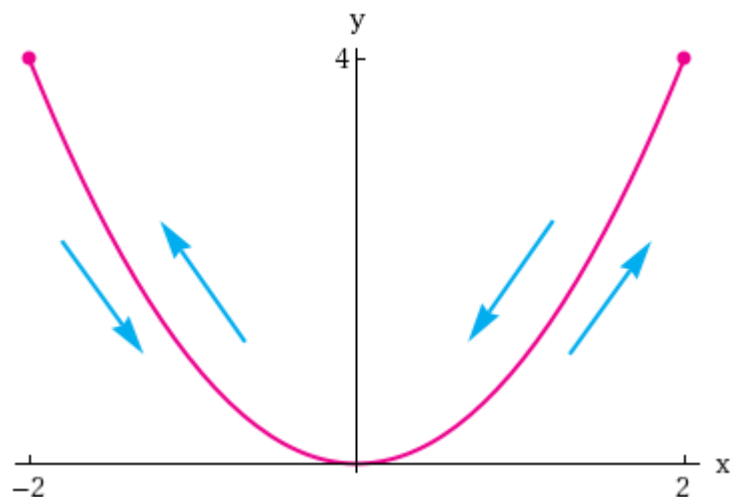




15.

-2 points

SCalcET8 10.1.AE.005.

[My Notes](#)[Ask Your Teacher](#)[Video Example](#) **EXAMPLE 5** Sketch the curve with parametric equations

$$x = 2 \sin(t), \quad y = 4 \sin^2(t).$$

**SOLUTION** Observe that  $y = (2 \sin(t))^2 = x^2$  and so the point  $(x, y)$  moves on the parabola  $y = x^2$ . But note also that, since  $-1 \leq \sin(t) \leq 1$ , we have  $\boxed{\phantom{00}} \leq x \leq \boxed{\phantom{00}}$ , so the parametric equations represent only the part of the parabola for which  $\boxed{\phantom{00}} \leq x \leq \boxed{\phantom{00}}$ . Since  $\sin(t)$  is periodic, the point

$$(x, y) = (2 \sin(t),$$

) moves back and forth infinitely many times along the parabola from  $(-2, \boxed{\phantom{00}})$  to  $(2, \boxed{\phantom{00}})$ .

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