

# Parametric Equations, Symmetric Equations, and Polar Conics

Parametric models, symmetric equations, and conics in alternate polar or parametric representations.

Name \_\_\_\_\_ Date \_\_\_\_\_

32 main 2-up grid 11 pages visible side quests

## Completion Reward



Shown here as a small pack artifact, not a preview destination.

### 1. What do parametric equations do?

- A. Always describe circles only
- B. Describe  $x$  and  $y$  in terms of a third parameter
- C. Replace trigonometry
- D. Give only one point

1.1. As  $t$  increases on a parametric curve, the point usually:

- A. stays fixed
- B. moves along the path
- C. must move right only
- D. must move upward only

1.2. Symmetric equations in 3D commonly describe:

- A. a line
- B. a circle only
- C. a parabola only
- D. a histogram

1.3. Which pair commonly parameterizes a unit circle?

- A.  $x = \cos t$ ,  $y = \sin t$
- B.  $x = t$ ,  $y = t^2$
- C.  $x = 2t + 1$ ,  $y = 3t$
- D.  $x = 1/t$ ,  $y = t$

1.4. A trig parameterization is useful when a curve has:

- A. circular behavior
- B. only straight-line behavior
- C. no graph
- D. a constant slope

1.5. A polar conic equation often tracks:

- A. distance from the pole as angle changes
- B. slope from intercept
- C. matrix rows
- D. only  $x$ -values

### 2. What do symmetric equations in 3D commonly describe?

- A. A parabola in the plane
- B. A circle centered at the origin
- C. A line in space
- D. A probability model

2.1. As  $t$  increases on a parametric curve, the point usually:

- A. stays fixed
- B. moves along the path
- C. must move right only
- D. must move upward only

2.2. Symmetric equations in 3D commonly describe:

- A. a line
- B. a circle only
- C. a parabola only
- D. a histogram

2.3. Which pair commonly parameterizes a unit circle?

- A.  $x = \cos t$ ,  $y = \sin t$
- B.  $x = t$ ,  $y = t^2$
- C.  $x = 2t + 1$ ,  $y = 3t$
- D.  $x = 1/t$ ,  $y = t$

2.4. A trig parameterization is useful when a curve has:

- A. circular behavior
- B. only straight-line behavior
- C. no graph
- D. a constant slope

2.5. A polar conic equation often tracks:

- A. distance from the pole as angle changes
- B. slope from intercept
- C. matrix rows
- D. only  $x$ -values

### 3. What does increasing the parameter usually do?

- A. Always increases  $x$  only
- B. Always increases  $y$  only
- C. Makes the graph disappear
- D. Moves the point along the curve in a chosen direction

3.1. As  $t$  increases on a parametric curve, the point usually:

- A. stays fixed
- B. moves along the path
- C. must move right only
- D. must move upward only

3.2. Symmetric equations in 3D commonly describe:

- A. a line
- B. a circle only
- C. a parabola only
- D. a histogram

3.3. Which pair commonly parameterizes a unit circle?

- A.  $x = \cos t$ ,  $y = \sin t$
- B.  $x = t$ ,  $y = t^2$
- C.  $x = 2t + 1$ ,  $y = 3t$
- D.  $x = 1/t$ ,  $y = t$

3.4. A trig parameterization is useful when a curve has:

- A. circular behavior
- B. only straight-line behavior
- C. no graph
- D. a constant slope

3.5. A polar conic equation often tracks:

- A. distance from the pole as angle changes
- B. slope from intercept
- C. matrix rows
- D. only  $x$ -values

4. Which parametric system describes the line  $y = 2x + 1$ ?

- A.  $x = t, y = 2t + 1$
- B.  $x = 2t + 1, y = t$
- C.  $x = t^2, y = 2t + 1$
- D.  $x = \cos(t), y = \sin(t)$

4.1. As  $t$  increases on a parametric curve, the point usually:

- A. stays fixed
- B. moves along the path
- C. must move right only
- D. must move upward only

4.2. Symmetric equations in 3D commonly describe:

- A. a line
- B. a circle only
- C. a parabola only
- D. a histogram

4.3. Which pair commonly parameterizes a unit circle?

- A.  $x = \cos t, y = \sin t$
- B.  $x = t, y = t^2$
- C.  $x = 2t + 1, y = 3t$
- D.  $x = 1/t, y = t$

4.4. A trig parameterization is useful when a curve has:

- A. circular behavior
- B. only straight-line behavior
- C. no graph
- D. a constant slope

4.5. A polar conic equation often tracks:

- A. distance from the pole as angle changes
- B. slope from intercept
- C. matrix rows
- D. only x-values

5. Which parametric system traces the unit circle?

- A.  $x = t, y = t^2$
- B.  $x = \sec(t), y = \tan(t)$
- C.  $x = \cos(t), y = \sin(t)$
- D.  $x = 1 + t, y = 1 - t$

5.1. As  $t$  increases on a parametric curve, the point usually:

- A. stays fixed
- B. moves along the path
- C. must move right only
- D. must move upward only

5.2. Symmetric equations in 3D commonly describe:

- A. a line
- B. a circle only
- C. a parabola only
- D. a histogram

5.3. Which pair commonly parameterizes a unit circle?

- A.  $x = \cos t, y = \sin t$
- B.  $x = t, y = t^2$
- C.  $x = 2t + 1, y = 3t$
- D.  $x = 1/t, y = t$

5.4. A trig parameterization is useful when a curve has:

- A. circular behavior
- B. only straight-line behavior
- C. no graph
- D. a constant slope

5.5. A polar conic equation often tracks:

- A. distance from the pole as angle changes
- B. slope from intercept
- C. matrix rows
- D. only x-values

6. Why eliminate the parameter?

- A. To rewrite the curve in rectangular form when possible
- B. To remove all points except one
- C. To force the curve to become linear
- D. To guarantee  $x$  and  $y$  are both increasing

6.1. Eliminating the parameter means rewriting the relation using:

- A.  $x$  and  $y$  only
- B.  $t$  only
- C. slope only
- D. the derivative

6.2. If  $x = 2t + 1$ , a good first step for elimination is:

- A. solve for  $t$
- B. set  $t = 0$
- C. square both sides
- D. differentiate

6.3. Why eliminate the parameter?

- A. to make a single  $x$ - $y$  equation
- B. to force  $x = y$
- C. to remove the graph
- D. to create a slope

6.4. In parametric equations, the parameter usually controls:

- A. color only
- B. motion along the curve
- C. the axis labels
- D. the number of variables

6.5. A valid line parameterization should make  $x$  and  $y$  change:

- A. independently with no relation
- B. in a coordinated way from the same parameter
- C. only upward
- D. only at whole numbers

**7. What does a polar conic equation often track?**

- A. Distance from a focus as the angle changes
- B. Only the x-intercept as time changes
- C. The determinant of a 2x2 matrix
- D. A sequence of probabilities

7.1. As  $t$  increases on a parametric curve, the point usually:

- A. stays fixed
- B. moves along the path
- C. must move right only
- D. must move upward only

7.2. Symmetric equations in 3D commonly describe:

- A. a line
- B. a circle only
- C. a parabola only
- D. a histogram

7.3. Which pair commonly parameterizes a unit circle?

- A.  $x = \cos t$ ,  $y = \sin t$
- B.  $x = t$ ,  $y = t^2$
- C.  $x = 2t + 1$ ,  $y = 3t$
- D.  $x = 1/t$ ,  $y = t$

7.4. A trig parameterization is useful when a curve has:

- A. circular behavior
- B. only straight-line behavior
- C. no graph
- D. a constant slope

7.5. A polar conic equation often tracks:

- A. distance from the pole as angle changes
- B. slope from intercept
- C. matrix rows
- D. only x-values

**8. If  $x = 2t + 1$  and  $y = 3t - 4$ , what is the best first step to eliminate  $t$ ?**

- A. Square both equations
- B. Differentiate both equations
- C. Convert to polar form
- D. Solve one equation for  $t$

8.1. Eliminating the parameter means rewriting the relation using:

- A.  $x$  and  $y$  only
- B.  $t$  only
- C. slope only
- D. the derivative

8.2. If  $x = 2t + 1$ , a good first step for elimination is:

- A. solve for  $t$
- B. set  $t = 0$
- C. square both sides
- D. differentiate

8.3. Why eliminate the parameter?

- A. to make a single  $x$ - $y$  equation
- B. to force  $x = y$
- C. to remove the graph
- D. to create a slope

8.4. In parametric equations, the parameter usually controls:

- A. color only
- B. motion along the curve
- C. the axis labels
- D. the number of variables

8.5. A valid line parameterization should make  $x$  and  $y$  change:

- A. independently with no relation
- B. in a coordinated way from the same parameter
- C. only upward
- D. only at whole numbers

**9. If  $x = 3\cos(t)$  and  $y = 3\sin(t)$ , what is the best way to eliminate  $t$ ?**

- A. Solve each equation for  $t$  separately
- B. Add  $x$  and  $y$
- C. Use the Law of Cosines
- D. Use  $\cos^2(t) + \sin^2(t) = 1$

9.1. As  $t$  increases on a parametric curve, the point usually:

- A. stays fixed
- B. moves along the path
- C. must move right only
- D. must move upward only

9.2. Symmetric equations in 3D commonly describe:

- A. a line
- B. a circle only
- C. a parabola only
- D. a histogram

9.3. Which pair commonly parameterizes a unit circle?

- A.  $x = \cos t$ ,  $y = \sin t$
- B.  $x = t$ ,  $y = t^2$
- C.  $x = 2t + 1$ ,  $y = 3t$
- D.  $x = 1/t$ ,  $y = t$

9.4. A trig parameterization is useful when a curve has:

- A. circular behavior
- B. only straight-line behavior
- C. no graph
- D. a constant slope

9.5. A polar conic equation often tracks:

- A. distance from the pole as angle changes
- B. slope from intercept
- C. matrix rows
- D. only x-values

10. A student has  $x = t + 2$  and writes  $t = x + 2$ . What is wrong?

- A.  $t$  should equal  $2x$
- B. You cannot solve for  $t$
- C. It should be  $t = x - 2$
- D. Nothing is wrong

10.1. Eliminating the parameter means rewriting the relation using:

- A.  $x$  and  $y$  only
- B.  $t$  only
- C. slope only
- D. the derivative

10.2. If  $x = 2t + 1$ , a good first step for elimination is:

- A. solve for  $t$
- B. set  $t = 0$
- C. square both sides
- D. differentiate

10.3. Why eliminate the parameter?

- A. to make a single  $x$ - $y$  equation
- B. to force  $x = y$
- C. to remove the graph
- D. to create a slope

10.4. In parametric equations, the parameter usually controls:

- A. color only
- B. motion along the curve
- C. the axis labels
- D. the number of variables

10.5. A valid line parameterization should make  $x$  and  $y$  change:

- A. independently with no relation
- B. in a coordinated way from the same parameter
- C. only upward
- D. only at whole numbers

11. A student says  $x = 3\cos(t)$ ,  $y = 3\sin(t)$  traces a line because  $x$  and  $y$  both change. What is wrong?

- A. Those equations keep  $x^2 + y^2$  fixed at 9, so the graph is a circle
- B. The graph is a parabola because sine is nonlinear
- C. Parametric equations can only make lines
- D. Nothing is wrong because both coordinates change

11.1. As  $t$  increases on a parametric curve, the point usually:

- A. stays fixed
- B. moves along the path
- C. must move right only
- D. must move upward only

11.2. Symmetric equations in 3D commonly describe:

- A. a line
- B. a circle only
- C. a parabola only
- D. a histogram

11.3. Which pair commonly parameterizes a unit circle?

- A.  $x = \cos t$ ,  $y = \sin t$
- B.  $x = t$ ,  $y = t^2$
- C.  $x = 2t + 1$ ,  $y = 3t$
- D.  $x = 1/t$ ,  $y = t$

11.4. A trig parameterization is useful when a curve has:

- A. circular behavior
- B. only straight-line behavior
- C. no graph
- D. a constant slope

11.5. A polar conic equation often tracks:

- A. distance from the pole as angle changes
- B. slope from intercept
- C. matrix rows
- D. only  $x$ -values

12. If  $x = 2t + 1$  and  $y = t^2$ , find  $x$  when  $t = 3$ . Answer with a number.

12.1. As  $t$  increases on a parametric curve, the point usually:

- A. stays fixed
- B. moves along the path
- C. must move right only
- D. must move upward only

12.2. Symmetric equations in 3D commonly describe:

- A. a line
- B. a circle only
- C. a parabola only
- D. a histogram

12.3. Which pair commonly parameterizes a unit circle?

- A.  $x = \cos t$ ,  $y = \sin t$
- B.  $x = t$ ,  $y = t^2$
- C.  $x = 2t + 1$ ,  $y = 3t$
- D.  $x = 1/t$ ,  $y = t$

12.4. A trig parameterization is useful when a curve has:

- A. circular behavior
- B. only straight-line behavior
- C. no graph
- D. a constant slope

12.5. A polar conic equation often tracks:

- A. distance from the pole as angle changes
- B. slope from intercept
- C. matrix rows
- D. only  $x$ -values

13. If  $x = 2t + 1$  and  $y = t^2$ , find  $y$  when  $t = 3$ .  
Answer with a number.

13.1. As  $t$  increases on a parametric curve, the point usually:

- A. stays fixed
- B. moves along the path
- C. must move right only
- D. must move upward only

13.2. Symmetric equations in 3D commonly describe:

- A. a line
- B. a circle only
- C. a parabola only
- D. a histogram

13.3. Which pair commonly parameterizes a unit circle?

- A.  $x = \cos t, y = \sin t$
- B.  $x = t, y = t^2$
- C.  $x = 2t + 1, y = 3t$
- D.  $x = 1/t, y = t$

13.4. A trig parameterization is useful when a curve has:

- A. circular behavior
- B. only straight-line behavior
- C. no graph
- D. a constant slope

13.5. A polar conic equation often tracks:

- A. distance from the pole as angle changes
- B. slope from intercept
- C. matrix rows
- D. only  $x$ -values

14. If  $x = 5\cos(t)$  and  $y = 5\sin(t)$ , find  $x$  when  $t = 0$ .  
Answer with a number.

14.1. As  $t$  increases on a parametric curve, the point usually:

- A. stays fixed
- B. moves along the path
- C. must move right only
- D. must move upward only

14.2. Symmetric equations in 3D commonly describe:

- A. a line
- B. a circle only
- C. a parabola only
- D. a histogram

14.3. Which pair commonly parameterizes a unit circle?

- A.  $x = \cos t, y = \sin t$
- B.  $x = t, y = t^2$
- C.  $x = 2t + 1, y = 3t$
- D.  $x = 1/t, y = t$

14.4. A trig parameterization is useful when a curve has:

- A. circular behavior
- B. only straight-line behavior
- C. no graph
- D. a constant slope

14.5. A polar conic equation often tracks:

- A. distance from the pole as angle changes
- B. slope from intercept
- C. matrix rows
- D. only  $x$ -values

15. If  $x = 5\cos(t)$  and  $y = 5\sin(t)$ , find  $y$  when  $t = \pi / 2$ .  
Answer with a number.

15.1. As  $t$  increases on a parametric curve, the point usually:

- A. stays fixed
- B. moves along the path
- C. must move right only
- D. must move upward only

15.2. Symmetric equations in 3D commonly describe:

- A. a line
- B. a circle only
- C. a parabola only
- D. a histogram

15.3. Which pair commonly parameterizes a unit circle?

- A.  $x = \cos t, y = \sin t$
- B.  $x = t, y = t^2$
- C.  $x = 2t + 1, y = 3t$
- D.  $x = 1/t, y = t$

15.4. A trig parameterization is useful when a curve has:

- A. circular behavior
- B. only straight-line behavior
- C. no graph
- D. a constant slope

15.5. A polar conic equation often tracks:

- A. distance from the pole as angle changes
- B. slope from intercept
- C. matrix rows
- D. only  $x$ -values

16. For  $x = 1 + t$ ,  $y = 2 - t$ ,  $z = 3t$ , find  $z$  when  $t = 2$ .  
Answer with a number.

16.1. As  $t$  increases on a parametric curve, the point usually:

- A. stays fixed
- B. moves along the path
- C. must move right only
- D. must move upward only

16.2. Symmetric equations in 3D commonly describe:

- A. a line
- B. a circle only
- C. a parabola only
- D. a histogram

16.3. Which pair commonly parameterizes a unit circle?

- A.  $x = \cos t$ ,  $y = \sin t$
- B.  $x = t$ ,  $y = t^2$
- C.  $x = 2t + 1$ ,  $y = 3t$
- D.  $x = 1/t$ ,  $y = t$

16.4. A trig parameterization is useful when a curve has:

- A. circular behavior
- B. only straight-line behavior
- C. no graph
- D. a constant slope

16.5. A polar conic equation often tracks:

- A. distance from the pole as angle changes
- B. slope from intercept
- C. matrix rows
- D. only  $x$ -values

17. For  $x = 1 + t$ ,  $y = 2 - t$ ,  $z = 3t$ , find  $y$  when  $t = 2$ .  
Answer with a number.

17.1. As  $t$  increases on a parametric curve, the point usually:

- A. stays fixed
- B. moves along the path
- C. must move right only
- D. must move upward only

17.2. Symmetric equations in 3D commonly describe:

- A. a line
- B. a circle only
- C. a parabola only
- D. a histogram

17.3. Which pair commonly parameterizes a unit circle?

- A.  $x = \cos t$ ,  $y = \sin t$
- B.  $x = t$ ,  $y = t^2$
- C.  $x = 2t + 1$ ,  $y = 3t$
- D.  $x = 1/t$ ,  $y = t$

17.4. A trig parameterization is useful when a curve has:

- A. circular behavior
- B. only straight-line behavior
- C. no graph
- D. a constant slope

17.5. A polar conic equation often tracks:

- A. distance from the pole as angle changes
- B. slope from intercept
- C. matrix rows
- D. only  $x$ -values

18. If  $x = t + 1$  and  $y = 2t - 3$ , what is  $y$  when  $x = 5$ ?  
Answer with a number.

18.1. Eliminating the parameter means rewriting the relation using:

- A.  $x$  and  $y$  only
- B.  $t$  only
- C. slope only
- D. the derivative

18.2. If  $x = 2t + 1$ , a good first step for elimination is:

- A. solve for  $t$
- B. set  $t = 0$
- C. square both sides
- D. differentiate

18.3. Why eliminate the parameter?

- A. to make a single  $x$ - $y$  equation
- B. to force  $x = y$
- C. to remove the graph
- D. to create a slope

18.4. In parametric equations, the parameter usually controls:

- A. color only
- B. motion along the curve
- C. the axis labels
- D. the number of variables

18.5. A valid line parameterization should make  $x$  and  $y$  change:

- A. independently with no relation
- B. in a coordinated way from the same parameter
- C. only upward
- D. only at whole numbers

19. If  $x = t^2$  and  $y = t$ , what is  $x$  when  $y = -3$ ?  
Answer with a number.

19.1. As  $t$  increases on a parametric curve, the point usually:

- A. stays fixed
- B. moves along the path
- C. must move right only
- D. must move upward only

19.2. Symmetric equations in 3D commonly describe:

- A. a line
- B. a circle only
- C. a parabola only
- D. a histogram

19.3. Which pair commonly parameterizes a unit circle?

- A.  $x = \cos t, y = \sin t$
- B.  $x = t, y = t^2$
- C.  $x = 2t + 1, y = 3t$
- D.  $x = 1/t, y = t$

19.4. A trig parameterization is useful when a curve has:

- A. circular behavior
- B. only straight-line behavior
- C. no graph
- D. a constant slope

19.5. A polar conic equation often tracks:

- A. distance from the pole as angle changes
- B. slope from intercept
- C. matrix rows
- D. only  $x$ -values

20. If  $r = 2 / (1 + \cos(\theta))$ , find  $r$  when  $\theta = \pi / 2$ . Answer with a number.

20.1. As  $t$  increases on a parametric curve, the point usually:

- A. stays fixed
- B. moves along the path
- C. must move right only
- D. must move upward only

20.2. Symmetric equations in 3D commonly describe:

- A. a line
- B. a circle only
- C. a parabola only
- D. a histogram

20.3. Which pair commonly parameterizes a unit circle?

- A.  $x = \cos t, y = \sin t$
- B.  $x = t, y = t^2$
- C.  $x = 2t + 1, y = 3t$
- D.  $x = 1/t, y = t$

20.4. A trig parameterization is useful when a curve has:

- A. circular behavior
- B. only straight-line behavior
- C. no graph
- D. a constant slope

20.5. A polar conic equation often tracks:

- A. distance from the pole as angle changes
- B. slope from intercept
- C. matrix rows
- D. only  $x$ -values

21. If  $r = 6 / (1 + 2\cos(\theta))$ , find  $r$  when  $\theta = \pi / 2$ . Answer with a number.

21.1. As  $t$  increases on a parametric curve, the point usually:

- A. stays fixed
- B. moves along the path
- C. must move right only
- D. must move upward only

21.2. Symmetric equations in 3D commonly describe:

- A. a line
- B. a circle only
- C. a parabola only
- D. a histogram

21.3. Which pair commonly parameterizes a unit circle?

- A.  $x = \cos t, y = \sin t$
- B.  $x = t, y = t^2$
- C.  $x = 2t + 1, y = 3t$
- D.  $x = 1/t, y = t$

21.4. A trig parameterization is useful when a curve has:

- A. circular behavior
- B. only straight-line behavior
- C. no graph
- D. a constant slope

21.5. A polar conic equation often tracks:

- A. distance from the pole as angle changes
- B. slope from intercept
- C. matrix rows
- D. only  $x$ -values

22. If  $x = 4 - t$  and  $y = 1 + 2t$ , find  $x$  when  $t = -2$ .  
Answer with a number.

22.1. As  $t$  increases on a parametric curve, the point usually:

- A. stays fixed
- B. moves along the path
- C. must move right only
- D. must move upward only

22.2. Symmetric equations in 3D commonly describe:

- A. a line
- B. a circle only
- C. a parabola only
- D. a histogram

22.3. Which pair commonly parameterizes a unit circle?

- A.  $x = \cos t$ ,  $y = \sin t$
- B.  $x = t$ ,  $y = t^2$
- C.  $x = 2t + 1$ ,  $y = 3t$
- D.  $x = 1/t$ ,  $y = t$

22.4. A trig parameterization is useful when a curve has:

- A. circular behavior
- B. only straight-line behavior
- C. no graph
- D. a constant slope

22.5. A polar conic equation often tracks:

- A. distance from the pole as angle changes
- B. slope from intercept
- C. matrix rows
- D. only  $x$ -values

23. If  $x = 4 - t$  and  $y = 1 + 2t$ , find  $y$  when  $t = -2$ .  
Answer with a number.

23.1. As  $t$  increases on a parametric curve, the point usually:

- A. stays fixed
- B. moves along the path
- C. must move right only
- D. must move upward only

23.2. Symmetric equations in 3D commonly describe:

- A. a line
- B. a circle only
- C. a parabola only
- D. a histogram

23.3. Which pair commonly parameterizes a unit circle?

- A.  $x = \cos t$ ,  $y = \sin t$
- B.  $x = t$ ,  $y = t^2$
- C.  $x = 2t + 1$ ,  $y = 3t$
- D.  $x = 1/t$ ,  $y = t$

23.4. A trig parameterization is useful when a curve has:

- A. circular behavior
- B. only straight-line behavior
- C. no graph
- D. a constant slope

23.5. A polar conic equation often tracks:

- A. distance from the pole as angle changes
- B. slope from intercept
- C. matrix rows
- D. only  $x$ -values

24. Write a parametric system for the line  $y = 3x - 2$  using  $x = t$ . Answer as an equation.

24.1. As  $t$  increases on a parametric curve, the point usually:

- A. stays fixed
- B. moves along the path
- C. must move right only
- D. must move upward only

24.2. Symmetric equations in 3D commonly describe:

- A. a line
- B. a circle only
- C. a parabola only
- D. a histogram

24.3. Which pair commonly parameterizes a unit circle?

- A.  $x = \cos t$ ,  $y = \sin t$
- B.  $x = t$ ,  $y = t^2$
- C.  $x = 2t + 1$ ,  $y = 3t$
- D.  $x = 1/t$ ,  $y = t$

24.4. A trig parameterization is useful when a curve has:

- A. circular behavior
- B. only straight-line behavior
- C. no graph
- D. a constant slope

24.5. A polar conic equation often tracks:

- A. distance from the pole as angle changes
- B. slope from intercept
- C. matrix rows
- D. only  $x$ -values

25. Eliminate  $t$  from  $x = t + 2$  and  $y = 3t - 1$ . Answer as an equation.

25.1. Eliminating the parameter means rewriting the relation using:

25.2. If  $x = 2t + 1$ , a good first step for elimination is:

- A.  $x$  and  $y$  only
- B.  $t$  only
- C. slope only
- D. the derivative

- A. solve for  $t$
- B. set  $t = 0$
- C. square both sides
- D. differentiate

25.3. Why eliminate the parameter?

25.4. In parametric equations, the parameter usually controls:

25.5. A valid line parameterization should make  $x$  and  $y$  change:

- A. to make a single  $x$ - $y$  equation
- B. to force  $x = y$
- C. to remove the graph
- D. to create a slope

- A. color only
- B. motion along the curve
- C. the axis labels
- D. the number of variables

- A. independently with no relation
- B. in a coordinated way from the same parameter
- C. only upward
- D. only at whole numbers

26. Eliminate  $t$  from  $x = 2\cos(t)$ ,  $y = 2\sin(t)$ . Answer as an equation.

26.1. As  $t$  increases on a parametric curve, the point usually:

26.2. Symmetric equations in 3D commonly describe:

- A. stays fixed
- B. moves along the path
- C. must move right only
- D. must move upward only

- A. a line
- B. a circle only
- C. a parabola only
- D. a histogram

26.3. Which pair commonly parameterizes a unit circle?

26.4. A trig parameterization is useful when a curve has:

26.5. A polar conic equation often tracks:

- A.  $x = \cos t$ ,  $y = \sin t$
- B.  $x = t$ ,  $y = t^2$
- C.  $x = 2t + 1$ ,  $y = 3t$
- D.  $x = 1/t$ ,  $y = t$

- A. circular behavior
- B. only straight-line behavior
- C. no graph
- D. a constant slope

- A. distance from the pole as angle changes
- B. slope from intercept
- C. matrix rows
- D. only  $x$ -values

27. Write the symmetric equations for  $x = 1 + 2t$ ,  $y = -3 + 4t$ . Answer as an equation.

27.1. As  $t$  increases on a parametric curve, the point usually:

27.2. Symmetric equations in 3D commonly describe:

- A. stays fixed
- B. moves along the path
- C. must move right only
- D. must move upward only

- A. a line
- B. a circle only
- C. a parabola only
- D. a histogram

27.3. Which pair commonly parameterizes a unit circle?

27.4. A trig parameterization is useful when a curve has:

27.5. A polar conic equation often tracks:

- A.  $x = \cos t$ ,  $y = \sin t$
- B.  $x = t$ ,  $y = t^2$
- C.  $x = 2t + 1$ ,  $y = 3t$
- D.  $x = 1/t$ ,  $y = t$

- A. circular behavior
- B. only straight-line behavior
- C. no graph
- D. a constant slope

- A. distance from the pole as angle changes
- B. slope from intercept
- C. matrix rows
- D. only  $x$ -values

28. Write a standard parameterization of the unit circle. Answer as an equation.

- A.  $x = \cos t, y = \sin t$
- B.  $x = t, y = t^2$
- C.  $x = 2t + 1, y = 3t$
- D.  $x = 1/t, y = t$

29. Write a simple polar conic form with eccentricity  $e$  and directrix parameter  $d$ . Answer as an equation.

- 29.3. Which pair commonly parameterizes a unit circle?
- A.  $x = \cos t, y = \sin t$
  - B.  $x = t, y = t^2$
  - C.  $x = 2t + 1, y = 3t$
  - D.  $x = 1/t, y = t$

30. Write a standard parameterization of  $y = x^2$ . Answer as an equation.

- 30.3. Which pair commonly parameterizes a unit circle?
- A.  $x = \cos t, y = \sin t$
  - B.  $x = t, y = t^2$
  - C.  $x = 2t + 1, y = 3t$
  - D.  $x = 1/t, y = t$

28.1. As  $t$  increases on a parametric curve, the point usually:

- A. stays fixed
- B. moves along the path
- C. must move right only
- D. must move upward only

28.4. A trig parameterization is useful when a curve has:

- A. circular behavior
- B. only straight-line behavior
- C. no graph
- D. a constant slope

29.1. As  $t$  increases on a parametric curve, the point usually:

- A. stays fixed
- B. moves along the path
- C. must move right only
- D. must move upward only

29.4. A trig parameterization is useful when a curve has:

- A. circular behavior
- B. only straight-line behavior
- C. no graph
- D. a constant slope

30.1. As  $t$  increases on a parametric curve, the point usually:

- A. stays fixed
- B. moves along the path
- C. must move right only
- D. must move upward only

30.4. A trig parameterization is useful when a curve has:

- A. circular behavior
- B. only straight-line behavior
- C. no graph
- D. a constant slope

28.2. Symmetric equations in 3D commonly describe:

- A. a line
- B. a circle only
- C. a parabola only
- D. a histogram

28.5. A polar conic equation often tracks:

- A. distance from the pole as angle changes
- B. slope from intercept
- C. matrix rows
- D. only  $x$ -values

29.2. Symmetric equations in 3D commonly describe:

- A. a line
- B. a circle only
- C. a parabola only
- D. a histogram

29.5. A polar conic equation often tracks:

- A. distance from the pole as angle changes
- B. slope from intercept
- C. matrix rows
- D. only  $x$ -values

30.2. Symmetric equations in 3D commonly describe:

- A. a line
- B. a circle only
- C. a parabola only
- D. a histogram

30.5. A polar conic equation often tracks:

- A. distance from the pole as angle changes
- B. slope from intercept
- C. matrix rows
- D. only  $x$ -values

31. If  $x = t - 1$  and  $y = 2t + 3$ , which rectangular equation is correct?

- A.  $y = 2x + 1$
- B.  $y = 2x + 5$
- C.  $y = x + 5$
- D.  $y = x - 5$

31.1. Eliminating the parameter means rewriting the relation using:

- A.  $x$  and  $y$  only
- B.  $t$  only
- C. slope only
- D. the derivative

31.2. If  $x = 2t + 1$ , a good first step for elimination is:

- A. solve for  $t$
- B. set  $t = 0$
- C. square both sides
- D. differentiate

31.3. Why eliminate the parameter?

- A. to make a single  $x$ - $y$  equation
- B. to force  $x = y$
- C. to remove the graph
- D. to create a slope

31.4. In parametric equations, the parameter usually controls:

- A. color only
- B. motion along the curve
- C. the axis labels
- D. the number of variables

31.5. A valid line parameterization should make  $x$  and  $y$  change:

- A. independently with no relation
- B. in a coordinated way from the same parameter
- C. only upward
- D. only at whole numbers

32. If  $x = 4\cos(t)$  and  $y = 4\sin(t)$ , which rectangular equation is correct?

- A.  $x + y = 4$
- B.  $y = 4x$
- C.  $x^2 - y^2 = 16$
- D.  $x^2 + y^2 = 16$

32.1. As  $t$  increases on a parametric curve, the point usually:

- A. stays fixed
- B. moves along the path
- C. must move right only
- D. must move upward only

32.2. Symmetric equations in 3D commonly describe:

- A. a line
- B. a circle only
- C. a parabola only
- D. a histogram

32.3. Which pair commonly parameterizes a unit circle?

- A.  $x = \cos t$ ,  $y = \sin t$
- B.  $x = t$ ,  $y = t^2$
- C.  $x = 2t + 1$ ,  $y = 3t$
- D.  $x = 1/t$ ,  $y = t$

32.4. A trig parameterization is useful when a curve has:

- A. circular behavior
- B. only straight-line behavior
- C. no graph
- D. a constant slope

32.5. A polar conic equation often tracks:

- A. distance from the pole as angle changes
- B. slope from intercept
- C. matrix rows
- D. only  $x$ -values