**Match the parametric equations with their graphs.**

**1. 2.**

**Sketch the curve given by the parametric equations.**

**3. 4.**

(Set Tmin: -2 and Tmax: 3) (Set Tmin: 0 and Tmax: 4)

**5.** Bryce Harper hits a baseball 3 feet above the ground, with an initial velocity of 100 ft/sec at an angle of 15° with the horizontal. Using the following parametric equations, will the ball clear a 10 foot wall that is 400 feet away? Draw a picture to help you answer the question.

|  |  |  |
| --- | --- | --- |
|  | Unit 12 Review |  |
| SM3H | Polar and Parametric Equations | Unit 12 |

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period: \_\_\_\_\_\_\_\_

**6.** Let’s say that Bryce Harper tries to hit the ball again, but this time with an angle of 23° with the horizontal. Using the new parametric equations, does he hit a home run? Draw a picture to help you answer the question.

**Plot the points with the given polar coordinates.**

**7. 8. 9.**

**Use algebra to find the rectangular coordinates of the points with the given polar coordinates.**

**10. 11.**

**Use algebra to find the polar coordinates of the points with the given rectangular coordinates.**

**12.** $(2, -1)$ **13.** $(1, 3)$

**Convert the following equations from rectangular form to polar form.**

**13. 14.**

**Convert the following equations from polar form to rectangular form.**

**15. 16.**

**17.** The locations of two UFOs in the night sky above BYU Stadium, given in polar coordinates, are (27*mi*, 122°) and (31*mi*, 97°). Find the distance between the two UFOs. First, draw a picture.

**WITHOUT A CALCULATOR, determine the number of petals on each rose curve, given the following equations. Then list how long each petal is.**

**18. 19. 20.**

**WITHOUT A CALCULATOR, determine what type of limaçon is represented by the following equations.**

**21. 22. 23.**

**WITHOUT A CALCULATOR, sketch the graph of each polar curve. Then name the type of polar curve. Show all work.**

**24. 25. 26.**



**27. 28. 29.**

**Graph each number in the complex plane, and find its absolute value.**

**30. 31. 32.**

**Express each complex number in polar form.**

**33. 34.**

**Graph each complex number on a polar grid. Then express it in rectangular form.**

**35. 36.**

**Find each product or quotient. Then express it in rectangular form.**

**37. 38.**

**Find each power. Then express it in rectangular form.**

**39.** $\left(4-i\right)^{5}$ **40.**

**Find all the distinct *p*th roots of the complex number.**

**41.**