Pre-Calculus Parametric Worksheet Name Key

1. Write parametric equations that will give you the following:

a) A circle with radius of 20 and center at the origin.

$x = 20\cos t$
$y = 20\sin t$

b) A circle with radius of 20 and center that has been moved to the right 10. (x)

$x = 20\cos t + 10$
$y = 20\sin t$

c) A circle with radius of 20 and center that has been moved down 10. (y)

$x = 20\cos t$
$y = 20\sin t - 10$

d) A circle with radius of 20 and center that has been moved to the left 10 and down 5. (x, y)

$x = 20\cos t - 10$
$y = 20\sin t - 5$

2. If you are going to graph one of these on your calculator, what should the t min and t max be? (In radians and degrees)

Radians: Tmin: 0 Tmax: 2π

Degrees: Tmin: 0 Tmax: 360

entire circle

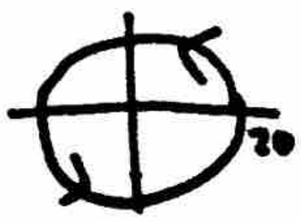
3. What does the t step do? How do does it affect your graph?

Determines how often a point is calculated.

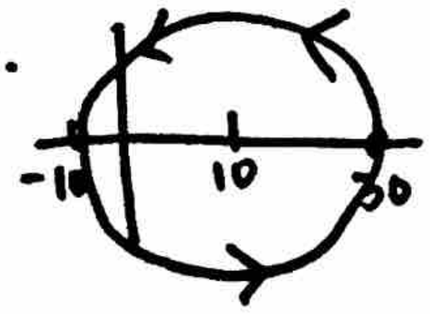
The smaller the Tstep the more accurate the graph.

4. Graph each of the above. Make sure you see the complete circle. Be sure to check all your settings (t min, t max, t step, etc.)

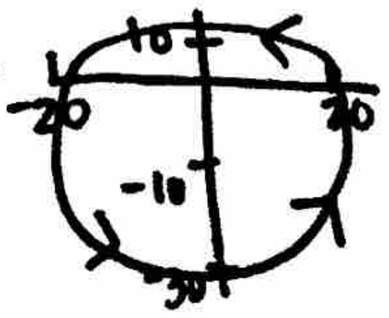
a.



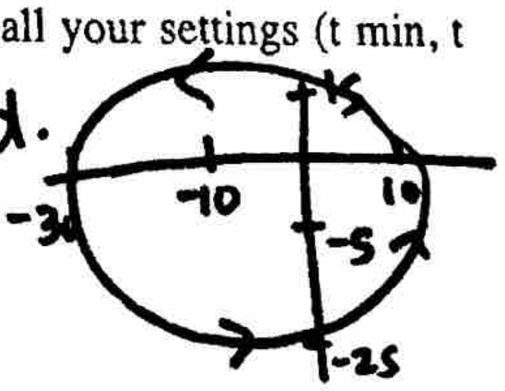
b.



c.



d.



5. Write an equation for the problem situation. An arrow is shot up (from the ground) with an initial velocity of 205 ft/sec at an angle of elevation of 48°. (Don't forget about gravity)

$x = 205\cos(48)t$
$y = 205\sin(48)t - 16t^2$

↑ gravity

6. Write an equation for the situation above but now the arrow is shot from 4 ft above the ground.

$x = 205\cos(48)t$

$y = 205\sin(48)t - 16t^2 + 4$

7. Write an equation for the same arrow (still shot from 4 ft above the ground) but now there is a wind blowing against the arrow at 8 ft/sec.

speed → multiply by t

$x = 205\cos(48)t - 8t$

$y = 205\sin(48)t - 16t^2 + 4$

8. What does the t represent in these equations?

time

9. Do you need to pay attention to the t setting when you graph these? Why?

Yes, so you get an accurate graph in its entirety.

10. Write an equation that would create a vertical line 12 units tall at $x = 400$.

$x = 400$

$y = 2T$ $(T_{max} = 6)$ Y equation depends on Tmax.

11. Suzy hit a baseball with an initial height of 4 ft, initial velocity of 114 ft/sec at an angle of 39°.

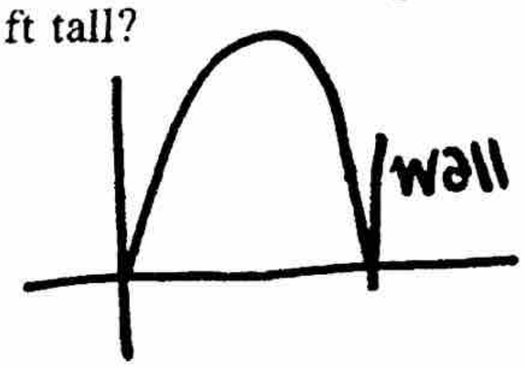
a) Write an equation to represent the problem.

$x = 114\cos(39)t$

$y = 114\sin(39)t - 16t^2 + 4$

b) If she hit it to straight away center field, would it make it over the wall if it is 400 ft from home plate and 12 ft tall?

See #10

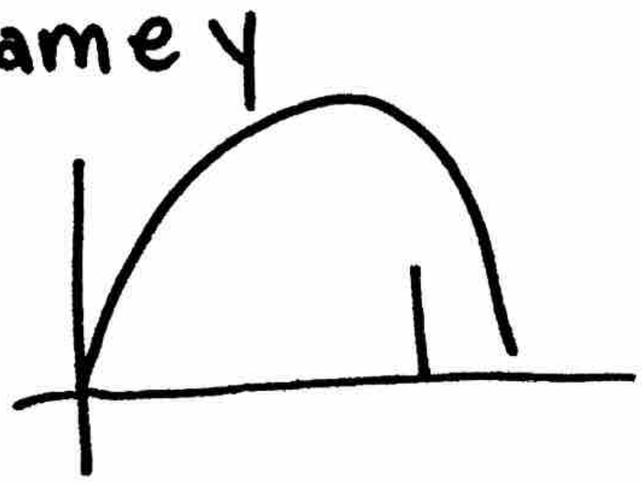


NO ☹

c) If there was a breeze blowing directly with the path of the ball at 7 ft/sec. Would it clear the wall then?

$x = 114\cos(39)t + 7t$

same y



Yes ☺