# Field Goal for the Win

**Pre-Assignment Activity**

Name _____

Class _____

This page is to be done by each student the day before starting the STEM Behind Sports activity.

**Part Two – A Different Way to Graph Points on a Grid**

We are going to create ordered pairs to graph on a grid in a different way than you have done before. We are going to use one equation, called $x(t)$ (read "x of t"), to calculate the x-coordinate and another equation, called $y(t)$ (read "y of t"), to calculate the y-coordinate. The independent variable is $t$, which can represent time. These are called parametric equations (not because there are two (a pair) of them).

Let's look at an example of parametric equations.

$x(t) = t + 2$
$y(t) = 2t - 1$

To plot the points described by these parametric equations, you can make a table supplying values for $t$, and then calculate values for $x$ and $y$ based upon the given equations.

For example, when $t = 4$, substitute 4 in place of $t$ in each equation and simplify:

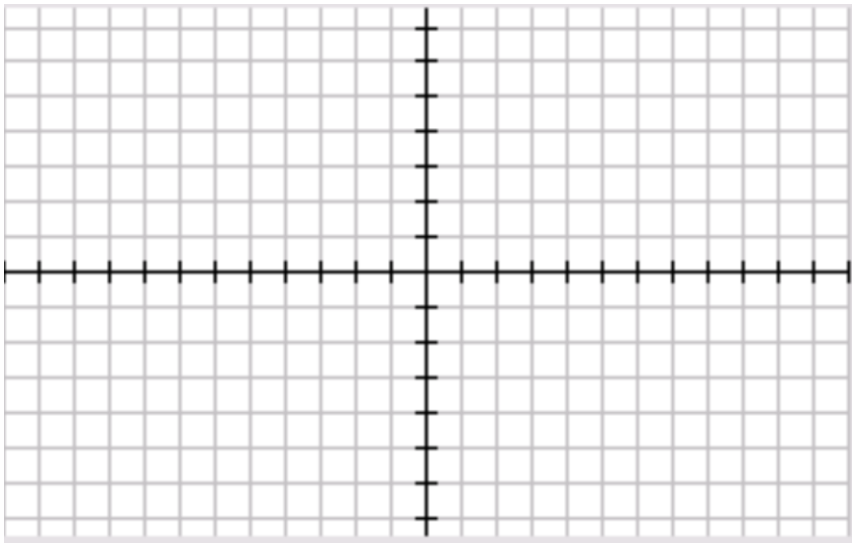
$x(t) = t + 2$ $y(t) = 2t - 1$ So $x(4) = 4 + 2 = 6$ $y(4) = 2(4) - 1 = 7$

Therefore, the ordered pair (6, 7) is on the graph of these parametric equations.

Let's generate several ordered pairs on the graph and organize them in the table below.
We will use $t = -3, -2, -1, 0, 1, 2, 3, 4$.

| $t$ | $x(t) = t + 2$ | $y(t) = 2t - 1$ | (x, y) |
|---|---|---|---|
| – 3 | | | |
| – 2 | | | |
| – 1 | | | |
| 0 | | | |
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | $x(4) = 4 + 2 = 6$ | $y(4) = 2(4) - 1 = 7$ | (6, 7) |

Plot these ordered pairs (x, y) below:



This is the graph of $x(t) = t + 2$, $y(t) = 2t - 1$

What pattern do you notice about these points?

We will use other parametric equations to do the activity Field Goal for the Win.