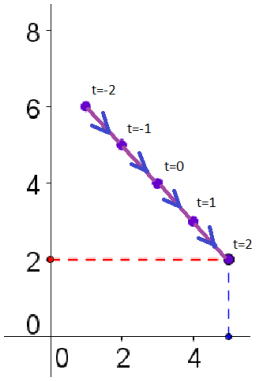
SM3H HW11.3 Parametric Equations

For problems 1-6, finish the parametric table and sketch the parametric curve.

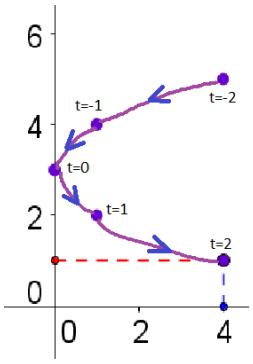
1) $a =< t+3, 4-t >$

t	$x(t)$	$y(t)$	$a=(x,y)$
-2	1	6	$(1,6)$
-1	2	5	$(2,5)$
0	3	4	$(3,4)$
1	4	3	$(4,3)$
2	5	2	$(5,2)$



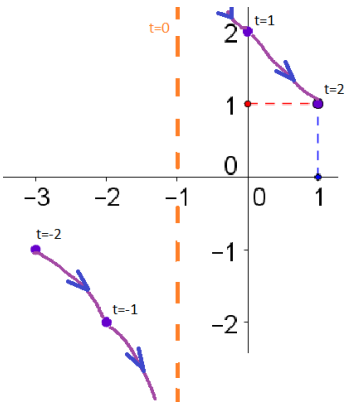
2) $b =< t^2, 3-t >$

t	$x(t)$	$y(t)$	$b=(x,y)$
-2	4	5	$(4,5)$
-1	1	4	$(1,4)$
0	0	3	$(0,3)$
1	1	2	$(1,2)$
2	4	1	$(4,1)$



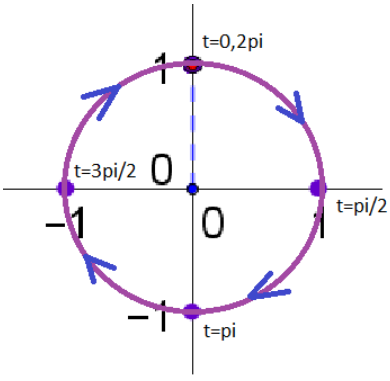
3) $c =< t-1, \frac{2}{t} >$

t	$x(t)$	$y(t)$	$c=(x,y)$
-2	-3	-1	$(-3,-1)$
-1	-2	-2	$(-2,-2)$
0	-1	undefined	$\emptyset$
1	0	2	$(0,2)$
2	1	1	$(1,1)$



4) $d =< \sin t, \cos t >$

t	$x(t)$	$y(t)$	$d=(x,y)$
0	0	1	$(0,1)$
$\frac{\pi}{2}$	1	0	$(1,0)$
π	0	-1	$(0,-1)$
$\frac{3\pi}{2}$	-1	0	$(-1,0)$
2π	0	1	$(0,1)$

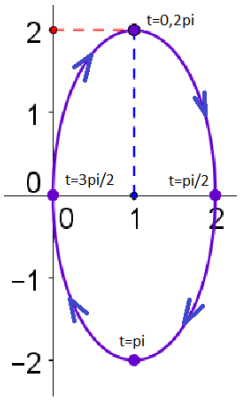


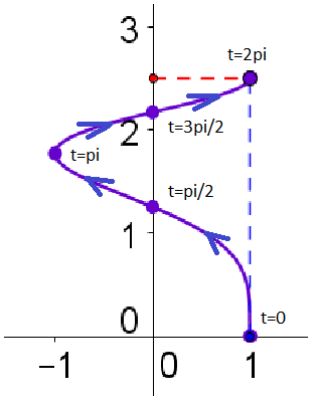
5) $f =< 1 + \sin t\,, 2\cos t >$

t	$x(t)$	$y(t)$	$f = (x, y)$
0	1	2	$(1, 2)$
$\frac{\pi}{2}$	2	0	$(2, 0)$
π	1	-2	$(1, -2)$
$\frac{3\pi}{2}$	0	0	$(0, 0)$
2π	1	2	$(1, 2)$

6) $g =< \cos t\,, \sqrt{t} >$

t	$x(t)$	$y(t)$	$g = (x, y)$
0	1	0	(1,0)
$\frac{\pi}{2}$	0	1.2533	(0,1.2533)
π	-1	1.7725	$(-1,1.7725)$
$\frac{3\pi}{2}$	0	2.1708	(0,2.1708)
2π	1	2.5066	(1,2.5066)



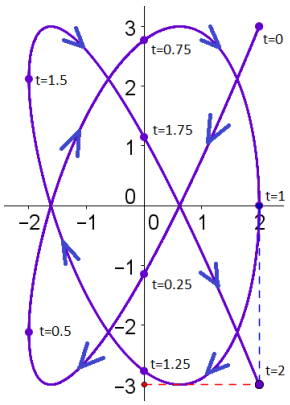


7. During a dance recital for Orem Dance Company, Tatum moves along a stage. Tatum's dance position, d, toward the right or left across the stage as a function of time is given by $x(t)$ with positive x-values indicating stage right while her positive toward or away from the audience is given by $y(t)$ with positive y-values meaning closer to the audience. t is measured in seconds after the moment she begins the dance. x, y are measured in feet.

$$d =< 2\cos(2\pi t)\,, 3\cos(2.5\pi t) >$$

Find Tatum's position during the first two seconds of the choreography by filling out the table and sketching $d(x, y)$:

t	$x(t)$	$y(t)$	$d(x, y)$
0	2	3	$(2, 3)$
0.25	0	-1.148	$(0, -1.148)$
0.5	-2	-2.121	$(-2, -2.121)$
0.75	0	2.772	$(0, 2.772)$
1	2	0	$(2, 0)$
1.25	0	-2.772	$(0, -2.772)$
1.5	-2	2.121	$(-2, 2.121)$
1.75	0	1.148	$(0, 1.148)$
2	2	-3	$(2, -3)$



8. During a football play, $t = 0$ represents the moment that the ball is snapped, which starts the clock. Jordy is allowed to move up to 2 seconds before the ball is snapped. Jordy's motion is given by the parametric equation $j =< t^2 + 2t - 2, t - 1 >$ with $-2 \leq t \leq 2$ being the restriction on t that describes Jordy's motion.

Find Jordy's position during $-2 \leq t \leq 2$ of the play by filling out the table and sketching $j(x, y)$:

t	$x(t)$	$y(t)$	$j(x, y)$
-2	-2	-3	$(-2, -3)$
-1	-3	-2	$(-3, -2)$
0	-2	-1	$(-2, -1)$
1	1	0	$(1, 0)$
2	6	1	$(6, 1)$