AP Calculus BC — Name

Supplement: Graphing and Rewriting Parametric — PP&V Day 1

1-3: Express in the form of y=f(x) by eliminating the parameter and graph each.

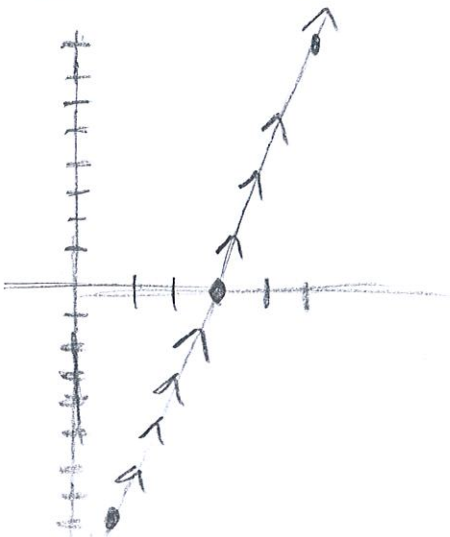
1. $x=t+3, \quad y=4t$

$t=x-3$

$y=4(x-3)$

$\boxed{y=4x-12}$

t	$x=t+3$	$y=4t$
-2	1	-8
0	3	0
2	5	8



2. $x=t^2, \quad y=t^3+1$

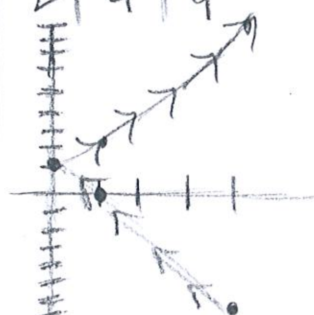
$t=\sqrt{x}$

$t=x^{1/2}$

$y=(x^{1/2})^3+1$

$\boxed{y=x^{3/2}+1}$

t	$x=t^2$	$y=t^3+1$
-2	4	-7
-1	1	0
0	0	1
1	1	2
2	4	9



3. $x=\ln t, \quad y=2-t$

$e \quad e$

$t=e^x$

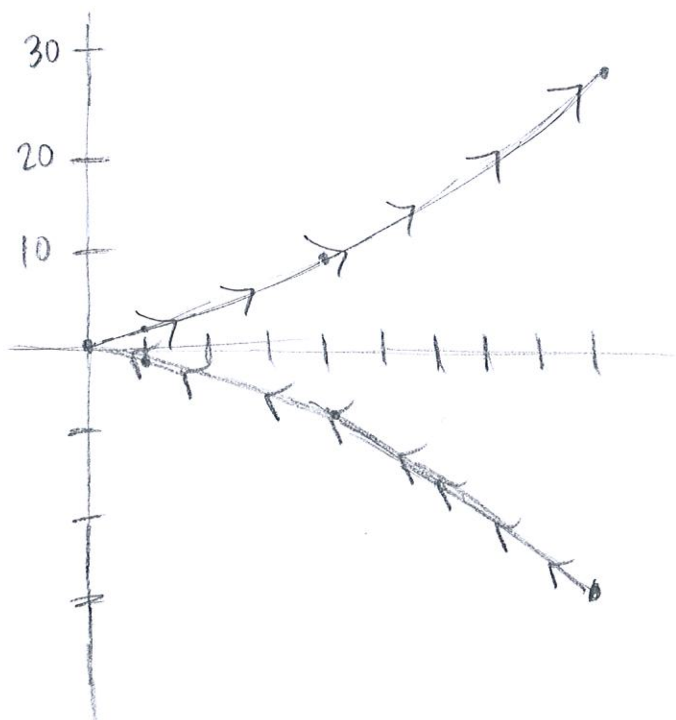
$\boxed{y=2-e^x}$

$t>0$

t	$x=\ln t$	$y=2-t$
1/4	-1.4	1.75
1/2	-.7	1.5
1	0	1
3	1.1	-1

4. Graph the curve and draw an arrow specifying the direction of motion for $x=t^2, \quad y=t^3$

t	$x=t^2$	$y=t^3$
-3	9	-27
-2	4	-8
-1	1	-1
0	0	0
1	1	1
2	4	8
3	9	27



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5-8: Find Parametric Equations for the given curve

circle: center $(-9,4)$ $R=7$

5. $4x - y^5 = 5$

$4x = 5 + y^5$

$x = \frac{5}{4} + \frac{1}{4}y^5$

$c(t) = \left(\frac{5}{4} + \frac{1}{4}t^5, t\right)$

6. $(x+9)^2 + (y-4)^2 = 49$

$c(t) = (-9 + 7\cos t, 4 + 7\sin t)$

7. Line through (2,5) Perpendicular to y=3x

$m = -\frac{1}{3}$

$c(t) = (2 + t, 5 - \frac{1}{3}t)$

8. $\left(\frac{x}{4}\right)^2 + \left(\frac{y}{9}\right)^2 = 1$

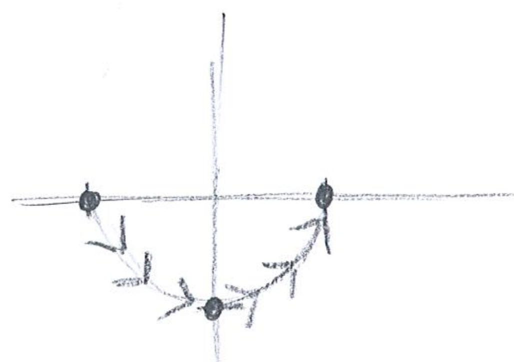
$c(t) = (4\cos t, 9\sin t)$

9. Find an interval of t values such that $c(t) = (\cos t, \sin t)$ traces the lower half of the unit circle.

$\pi \le t \le 2\pi$

$-\pi \le t \le 0$

t	$x = \cos t$	$y = \sin t$
π	-1	0
$\frac{3\pi}{2}$	0	-1
2π	1	0



10. Find an interval of t-values such that $c(t) = (2t+1, 4t-5)$ parametrizes the segment from $(0,-7)$ to $(7,7)$.

$2t + 1 = 0$ OR $4t - 5 = -7$

$t = -\frac{1}{2}$ $\quad 4t = -2$

$t = -\frac{1}{2}$

$2t + 1 = 7$ OR $4t - 5 = 7$

$2t = 6$ $\quad 4t = 12$

$t = 3$ $\quad t = 3$

$-\frac{1}{2} \le t \le 3$