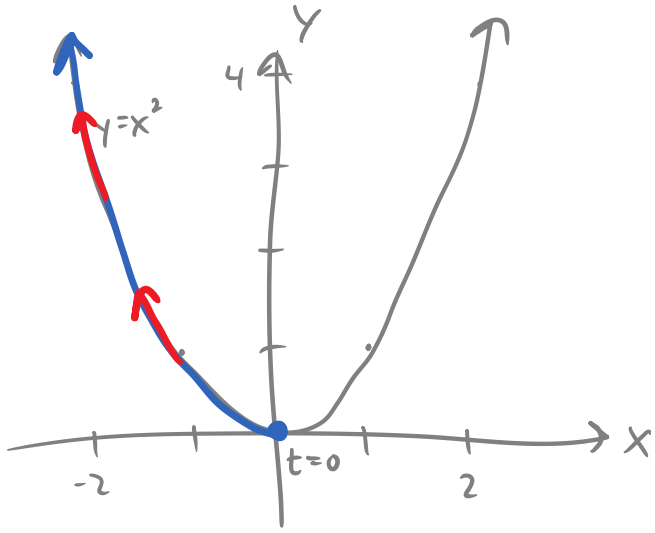
1. Given the following parametric equations/intervals of a particle in the xy-plane, find the related Cartesian equation and graph it. Then, indicate the portion of the graph traced by the particle and the direction of motion.

$x = -\sqrt{t},\ y = t,\ t \geq 0$

$x = -\sqrt{y}$

$y = x^2$

parabola



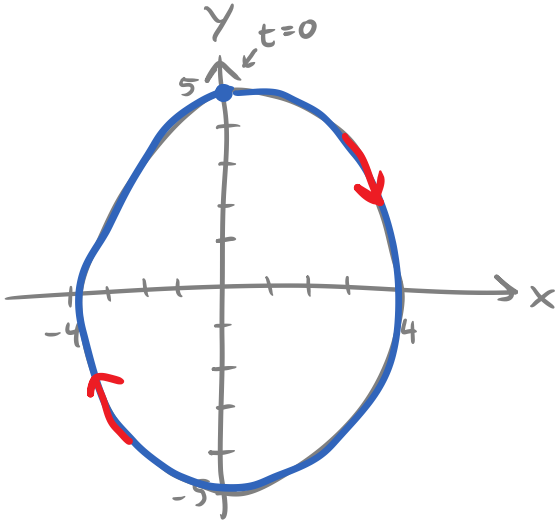
2. Given the following parametric equations/intervals of a particle in the xy-plane, find the related Cartesian equation and graph it. Then, indicate the portion of the graph traced by the particle and the direction of motion.

$x = 4\sin t,\ y = 5\cos t,\ 0 \leq t \leq 2\pi$

$\sin t = \frac{x}{4}$, $\cos t = \frac{y}{5}$

$\sin^2 t + \cos^2 t = 1$

$\frac{x^2}{16} + \frac{y^2}{25} = 1$ ← Ellipse



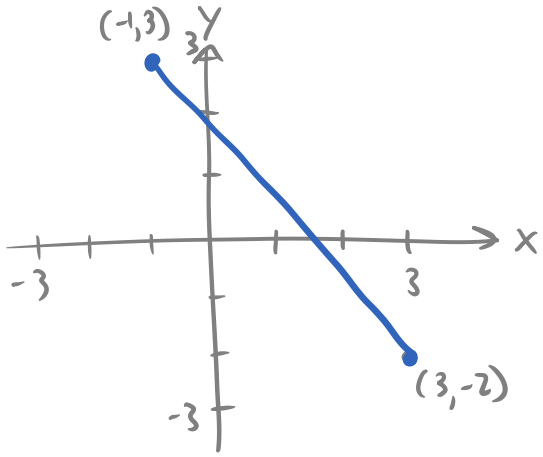
3. Find a parametrization for the line segment with endpoints $(-1,3)$ and $(3,-2)$.

$x = -1 + \overbrace{(3-(-1))}^{\Delta x} t$

$= -1 + 4t$

$y = 3 + \overbrace{(-2-3)}^{\Delta y} t$

$= 3 - 5t$



$x = -1+4t,\ y = 3-5t,\ 0 \le t \le 1$

Travels from $(-1,3)$ to $(3,-2)$.

Note: Above method is good to learn for Math 280!

OR

Slope of segment is $m = \frac{-2-3}{3-(-1)} = \frac{-5}{4}$.

Segment is on the line:

$y - 3 = \frac{-5}{4}(x-(-1))$

$y = \frac{-5}{4}x + \frac{7}{4}$

$x = t,\ y = \frac{-5}{4}t + \frac{7}{4},\ -1 \le t \le 3$

Q: A bus driver was heading down a street in Walnut. He went right past a stop sign without stopping, went the wrong way on a one-way street, and then went on the left side of the road past a cop car. The cop did nothing, because he didn't break any traffic laws. Why not?