2. First, we have that:

$$a(0) = (0,0,5),$$
$$a(-8\pi) = \left(0, -\frac{8\pi}{5}, 5\right)$$
$$Z_{min} = 2, Z_{max} = 5$$

We can see that this trace is created by a circle which is continuously moved along the y axis, so the x and z coordinates will be some variation of cos and sin of some expression. We have

$$a(-8\pi) = \left(0, -\frac{8\pi}{5}, 5\right)$$

And so we know that when s = -8π, then x = 0.
We also know that when s = 0, then, x = 0. In order to get 8 full circles in the span of 16 π, we have to have the expression cos(s) and in order to adjust for the starting and 0 points, we add $\frac{\pi}{2}$ to the angle, leaving us with cos(s+$\frac{\pi}{2}$). The final adjustment is for the radius which is 1.5 (we have $Z_{min} = 2, Z_{max} = 5$), and so we get:
x = 1.5cos(s+$\frac{\pi}{2}$).

Y changes constantly and ranges from $-\frac{8\pi}{5}$ to $\frac{8\pi}{5}$, so we get:
y = $\frac{s}{5}$.

The definition of z comes similarly to x; the only difference is that the circle radius is at a distance of 3.5 from the XY plane, because $Z_{min} = 2, Z_{max} = 5$, and so we get:
z = 3.5 +1.5sin(s+$\frac{\pi}{2}$).

3. β (s) is the perspective projection of α(s), so for every point p we will define its projected point $p_i = \left(\frac{p_x * f}{p_z}, \frac{p_y * f}{p_z}\right)$, so we substitute the terms and get:

$$p_i = \left(\frac{6\cos\left(s + \frac{\pi}{2}\right)}{3.5 + 1.5\sin\left(s + \frac{\pi}{2}\right)}, \frac{3s}{3.5 + 1.5\sin\left(s + \frac{\pi}{2}\right)}\right)$$