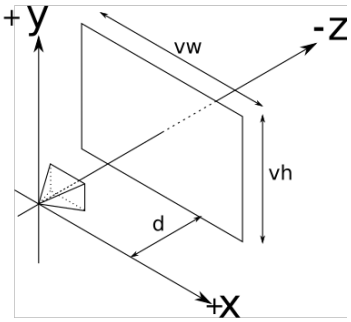
CSCI 480 / 580 – January 22, 2020 – Ray generation exercises

1a. You have a canonical perspective camera (i.e., centered at the origin, looking at the -z axis, with vh = vw = d =1). Your image is 400x400 pixels. The *(u, v)* coordinates of a particular pixel are (0.2, 0.1). What is the viewing ray for this pixel? Write the ray in parametric form (i.e., $\boldsymbol{p} + t\boldsymbol{d}$).



1b. Out in the scene, there is a planar object occupying the entire plane at $z = -6$. What is the value of t at the intersection point of the above ray with the scene?

1c. What are the x, y, z coordinates of the intersection point?

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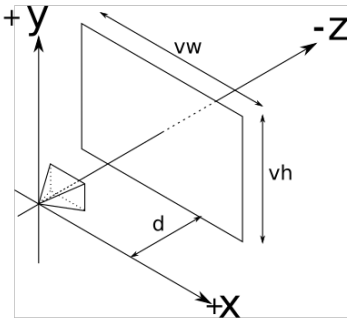

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   - **eye** – the 3D position of the eye
   - **at** – the 3D position of a point the camera is looking directly at; in other words, a point that projects to the center of the image
   - **up** – a 3-vector that gives the direction of "up" in the scene, but not necessarily directly up in image space

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