// create a value of 0. or 1. from the value of x wrt edge:
float t = step( float edge, float x );

// create a value in the range 0. to 1. from the value of x wrt edge0 and edge1:
float t = smoothstep( float edge0, float edge1, float x );

// use the returned value from step( ) or smoothstep( ) to blend value0 to value1:
T out = mix( T value0, T value1, float t );
“SmoothPulse” in a Fragment Shader

```glsl
in float vX, vY;
in vec3 vColor;
in float vLightIntensity;
uniform float uA;
uniform float uP;
uniform float uTol;

const vec3 WHITE = vec3( 1., 1., 1.);

void main()
{
  float f = fract( uA*vX );
  float t = smoothstep( 0.5-uP-uTol, 0.5-uP+uTol, f )  - smoothstep( 0.5+uP-uTol, 0.5+uP+uTol, f );
  vec3 rgb = vLightIntensity * mix( WHITE, vColor, t );
  gl_FragColor = vec3( rgb, 1. );
}
```

Moral: There are many ways to turn \([0., 1.]\) into \([0., 1.]\)
Why Do These Two Curves Match So Closely?

The Taylor Series expansion of $y = \sin^2\left(\frac{\pi x}{2}\right)$ around $x=0.5$ is:

$$y = \left(1 - \frac{x^2}{4} + \frac{x^4}{96}\right) + x\left(\frac{\pi^2}{2} - \frac{x^2}{16}\right) + x^3\left(\frac{\pi^2}{8} - \frac{x^2}{12}\right)$$

$$= 0.038 - 0.37x + 3.88x^2 - 2.58x^3$$

which is pretty close to: $y = 3x^2 - 2x^3$

Cubic vs. Quintic

Both go from 0. to 1.
Both have initial and final slopes of 0.
The quintic has initial and final curvatures of 0.