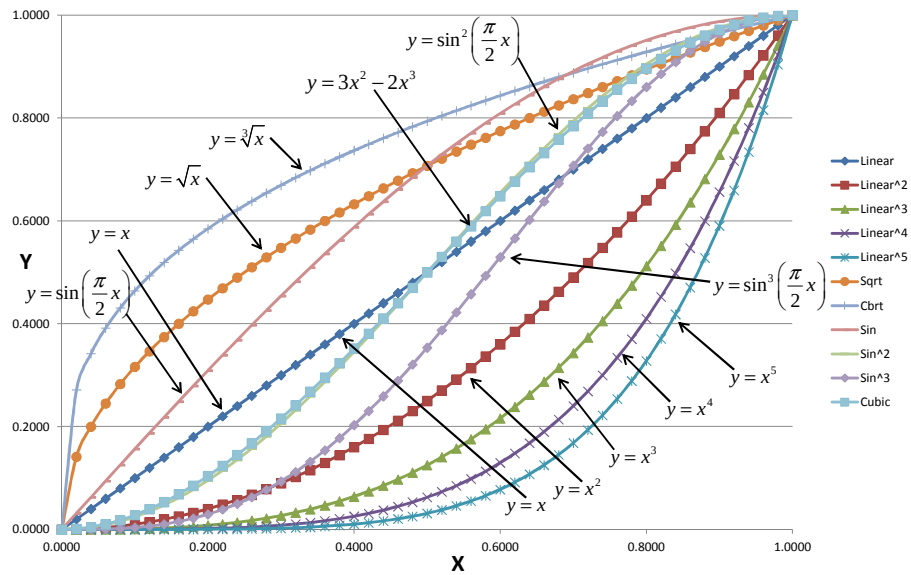
Fun With One



Moral: There are many ways to turn [0.-1.] into [0.-1.]

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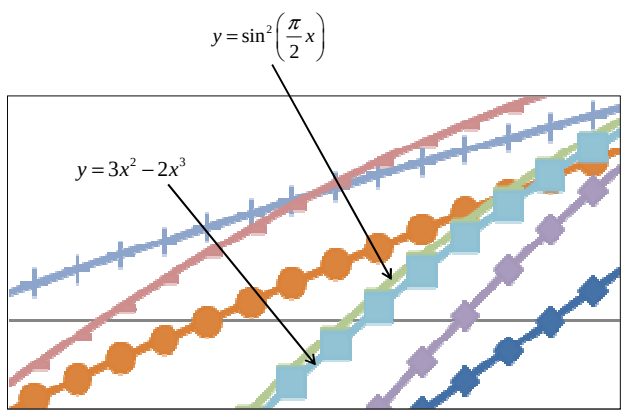
Why Do These Two Curves Match So Closely?



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

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

$$=.038-.37x+3.88x^2-2.58x^3$$

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

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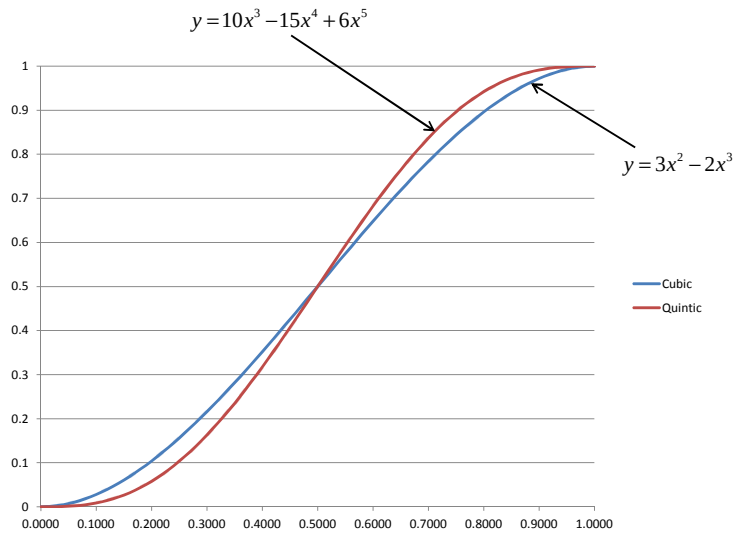
Cubic vs. Quintic



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

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