

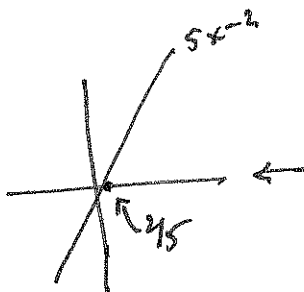
Domain = all x
 $f(0) = 0$ $f(1) = 0$ $f(-1) = -2$

$$y = f(x) = x^{2/3}(x-1)$$

No vert. asymptotes: $\lim_{x \rightarrow a} x^{2/3}(x-1) = a^{2/3}(a-1)$ for all a ;
 limit is never $\pm \infty$

$$y' = f'(x) = x^{2/3} + (x-1)\left(\frac{2}{3}x^{-1/3}\right) = x^{-1/3}\left(x + \frac{2}{3}(x-1)\right) = x^{-1/3}\left(\frac{5}{3}x - \frac{2}{3}\right)$$

$$= \frac{1}{3}x^{-1/3}(5x-2)$$



	$-\infty$	0	$2/5$	∞
$x^{-1/3}$				
$5x-2$	-			
$f'(x)$	+	-	+	
$f(x)$	inc	dec	inc	

$$f'(x) = \frac{1}{3} \frac{5x-2}{x^{1/3}}$$

$$f'(0) \text{ d.n.e.}$$

$$f'(2/5) = 0$$

local max at 0 local min at $2/5$: $f(2/5) = -0.33$

$$y'' = f''(x) = x^{-1/3}\left(\frac{5}{3}\right) + \left(\frac{5}{3}x - \frac{2}{3}\right)\left(-\frac{1}{3}x^{-4/3}\right) = \frac{5}{3}x^{-1/3} - \frac{1}{9}(5x-2)x^{-4/3}$$

$$= x^{-4/3}\left(\frac{5}{3}x - \frac{1}{9}(5x-2)\right) = x^{-4/3}\left(\frac{10}{9}x + \frac{2}{9}\right)$$

$$= \frac{2}{9}x^{-4/3}(5x+1)$$

$$f''(0) \text{ d.n.e.}$$

$$f''(-1/5) = 0$$

	$-\infty$	$-1/5$	0	∞
$\frac{2}{9}x^{-4/3}$				
$5x+1$				
$f''(x)$	+	+	+	
$f'(x)$	dec	inc	inc	
$f(x)$	CD	CU	CU	

Note:
 $x^{-4/3} = \frac{1}{(\sqrt[3]{x})^4}$
 > 0 for all $x \neq 0$.

inflexion point at $-1/5$

$$f(-1/5) \approx -0.41$$

