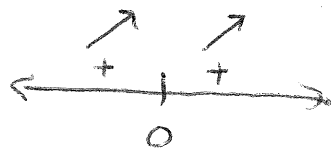


Ch. 3.3 Homework p. 186-188

#19, 21, 25, 27, 29, 31, 33, 37, 55-71 odds, 80

27) $f(x) = x^{1/3} + 1$

$f'(x) = \frac{1}{3}x^{-2/3} = \frac{1}{3x^{2/3}} \quad x=0$

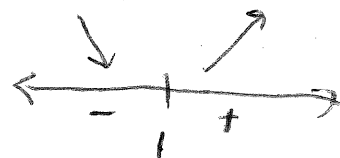


$f(x)$ is increasing $(-\infty, 0) \cup (0, \infty)$ b/c $f'(x) > 0$

No relative extrema

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

$f'(x) = \frac{2}{3}(x-1)^{-1/3} \Big|_1 = \frac{2}{3(x-1)^{1/3}} \quad \boxed{x=1}$



$f(x)$ is decreasing $(-\infty, 1)$ b/c $f'(x) < 0$

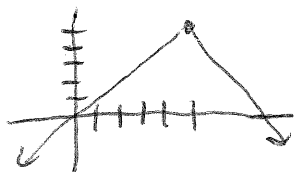
$f(x)$ is increasing $(1, \infty)$ b/c $f'(x) > 0$

Relative min at $(1, 0)$ b/c $f'(x)$ changes from - to +.

31) $f(x) = 5 - |x-5|$

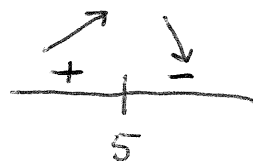
$f(x) = -|x-5| + 5$

Vertex $(5, 5)$



$$f(x) = \begin{cases} -(x-5) + 5 & \text{if } x > 5 \\ --(x-5) + 5 & \text{if } x < 5 \end{cases}$$

$$f'(x) = \begin{cases} -1 & \text{if } x > 5 \\ 1 & \text{if } x < 5 \end{cases}$$



$f(x)$ increasing $(-\infty, 5)$ b/c $f'(x) > 0$

$f(x)$ decreasing $(5, \infty)$ b/c $f'(x) < 0$

Rel. max at $(5, 5)$ b/c $f'(x)$ changes from + to -.