

1. a.  $(1,3)(4,6)$  b.  $(0,1)(3,4)$

c.  $(0,1)(3,4)(4,6)$

e.  $(3,4)$

2.  $f$  is increasing from  $[0,3]$ , and decreasing from  $[3,6]$

b. local max at  $x=3$

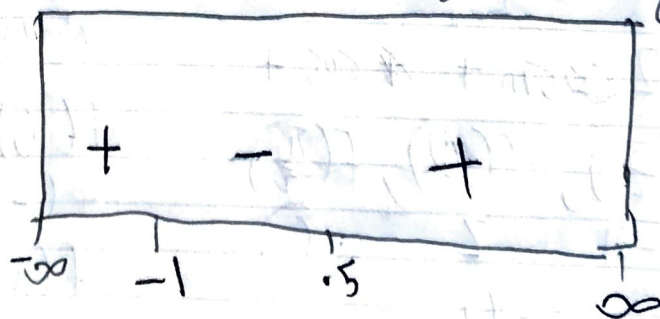
6. increasing from  $[2,4]$ , decreasing from  $[0,2]$  and  $[4,6]$

6b. local min:  $x=2$

local max:  $x=4$

1.6.  $f'(x) = 12x^2 + 6x - 6$   
 $2(6x^2 + x - 1)$   
 $6(x+1)(2x-1)$

critical =  $-1, 5$



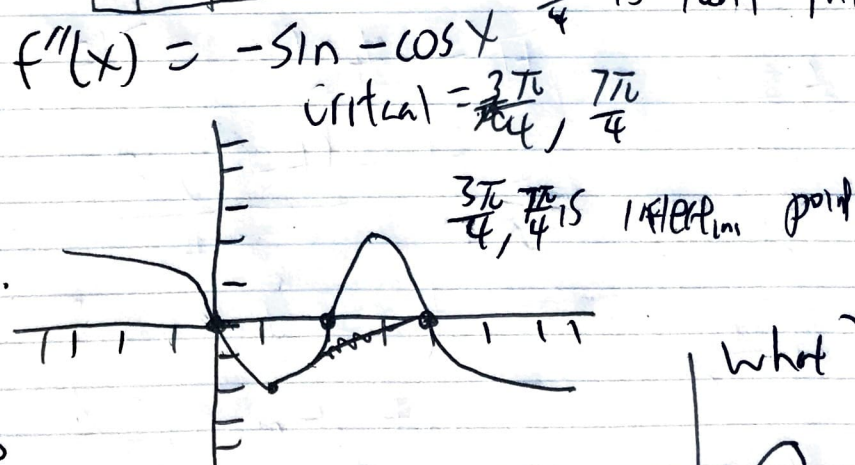
12.  $\frac{x^2 + 1 - 2x^2}{(x^2 + 1)^2}$  crit: -1, 1  
 $f'(x)$  is  $< -1$  for all  $x < -1$  and  $x > 1$   
 $f'(x)$  is positive for  $-1 < x < 1$

13. local min  $= x=0$

13.  $f'(x) \cos x - \sin x$   
 $f$  is decreasing from  $(\frac{\pi}{4}, \frac{5\pi}{4})$  on the interval  $\frac{\pi}{4} \leq x \leq \frac{5\pi}{4}$ .  
 $\frac{\pi}{4}$  is local max  
 $\frac{5\pi}{4}$  is local min

44 c.  
 $f'(x) = (-2x)e^{x^2}$   
 concave down

$(-\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2})$  25.



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46 no asymptote left u)  
 horizontal is  $\frac{1}{4}$   
 min is -1

$f' = \frac{2x(x^2+4)}{(x^2+4)^2}$   
 $f'(x) < 0$   $x < 0$   
 $f'(x) > 0$   $x > 0$

49.  $e^{-x^2}$  horizontal = 0  
 $f'(x) > 0$  when  $x > 0$   
 $f'(x) < 0$  when  $x < 0$   
 inflection no  $-\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2}$   
 concave up  $x > 0$   
 $(-\infty, \frac{\sqrt{2}}{2}), (\frac{\sqrt{2}}{2}, \infty)$

