

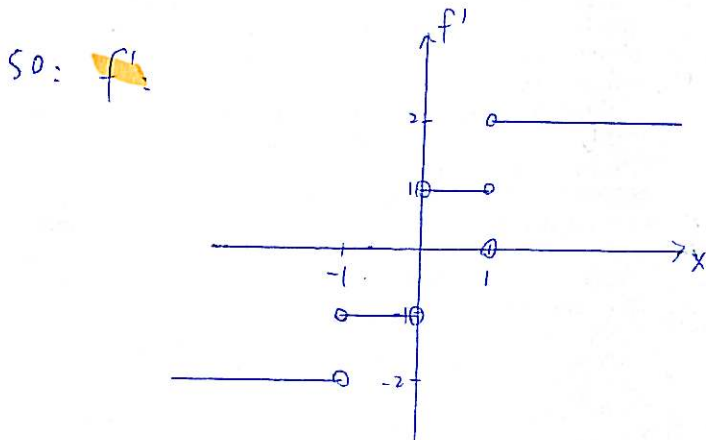
2.7 #2 not differentiable @ $x = -1, 0, 1$ because graph is not smooth @ those points.

$$x > 1, f' = \frac{2-0}{2-1} = 2$$

$$0 < x < 1, f' = \frac{0-(-1)}{1-0} = 1$$

$$-1 < x < 0, f' = \frac{0-(-1)}{-1-0} = -1$$

$$x < -1, f' = \frac{2-0}{(-2)-(-1)} = -2$$



#7 $(s^{\frac{1}{4}})' \Big|_{s=4} = \frac{1}{4} s^{-\frac{3}{4}} \Big|_{s=4} = \frac{1}{4} \cdot \frac{1}{4^{\frac{3}{4}}} = \frac{1}{2^2} \cdot \frac{1}{2^{\frac{3}{2}}} = \frac{1}{2^{\frac{7}{2}}} = 2^{-\frac{7}{2}}$

0.088 or $= \frac{1}{4} \cdot \frac{1}{4^{\frac{3}{4}}} = \frac{1}{4^{\frac{7}{4}}} = 4^{-\frac{7}{4}}$

#12 ① $f'(x) = 3x^2, x=1 \Rightarrow f' = 3$

② $g'(x) = 2x, x=1 \Rightarrow g' = 2$

$$\textcircled{3} \quad h'(x) = 1 \Rightarrow \text{always} = 1$$

$$\textcircled{4} \quad f'(x) + g'(x) + h'(x) \Big|_{x=1}$$

$$= 3 + 2 + 1 = 6$$

$$2.8 \text{ \#3} \quad g(x) = (-5-x)(-2-2x)$$

$$= (x+5)(2x+2)$$

$$= 2x^2 + 12x + 10$$

$$g' = 4x + 12$$

~~4x+12~~

#6

$$\left(\frac{x^2-10}{x^2+10} \right)' = \frac{(x^2-10)'(x^2+10) - (x^2-10)(x^2+10)'}{(x^2+10)^2}$$

$$= \frac{2x(x^2+10) - (x^2-10)(2x)}{(x^2+10)^2}$$

$$= \frac{\cancel{2x^3} + 20x - \cancel{2x^3} + 20x}{(x^2+10)^2} = \frac{40x}{(x^2+10)^2}$$

$$x=3, \quad \frac{40(3)}{(3^2+10)^2} = \frac{120}{19^2} = \frac{120}{361} = 0.3324$$