

a)
$$\ln 5(x) = \ln (x+4)^{4} + \ln (2x+3)^{\frac{1}{2}} - \ln (4x^{2}-8x)$$

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

b)
$$\frac{f'(x)}{f(x)} = \frac{4}{n+4} + \frac{2}{2(2n+3)} - \frac{4}{x} + \frac{2x}{x^2-2}$$

 $f'(x) = f(x) \cdot \left[\frac{4}{x+4} + \frac{1}{2n+3} - \frac{4}{x} + \frac{2x}{x^2-2} \right]$

c) logarithmic differentiation

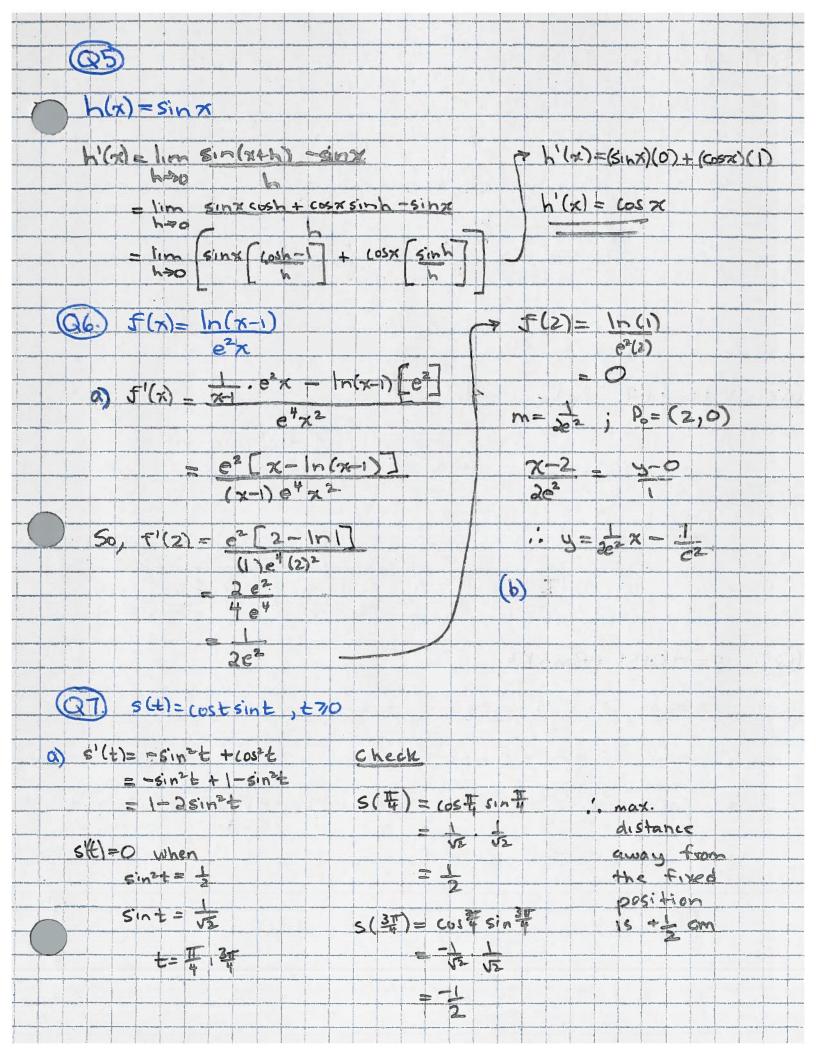
= 7(1)

= 1

$$g'(x) = \lim_{h \to 0} \ln \frac{\ln(x+h) = \ln x}{h}$$

$$= \lim_{h \to 0} \frac{1}{h} \cdot \ln(\frac{x+h}{x})$$

$$= \lim_{h \to 0} \frac{1}{h} \cdot \ln(1+\frac{x+h}{x})$$



(Q7) b) s/(+)= cos2+ -sin2+

i'. the initial velocity 18 1 cm/s.

5'(0)= cos20 -sin20 = 1 cm/s

= - Hsint) wast e - 4 sint cust

c) a(t) = s"(t) . Note: s'(t)= 1-2 sinet = 1-2(sint)

IF altheo .' sinte o or coste o 七=0,1

So, the required velocity is s'(0) = 1 cm/s.

(08) V(t)=e(2-12)+1.6

V(b)= e(2")+1.6 So, the value of the collection in = 3.522/155... 2008 15 6352.21

(V'(+)= e[Ing. 2 12 - 12] So, V'(6) = - eln2.23 = - 0.079507...

So, the IROC of the value of the collection in 2008 is decreasing by \$7.85/yr.

(Q9) Y= A coskt + Bsin Kt

y'= - AKsinKt + BK LOSKt

y" = - AK 2 coskt - BK2 sinkt

So, Y"+K24 = -AK2 coskt -BK2 sinkt + AK2 coskt + BK2 sinkt = 0