

Math 181 Honors Quiz 9 Version A

1. Find the following derivatives:

(i) $\frac{d}{dx}(x^2 \sin x)$

(ii) $\frac{d}{dx} \sin(\sin x)$

2. Two ships start at the same point, but the first ship leaves at noon and sails east at the rate of 20 mi/hr and the second leaves at 1pm and sails south at 25 mi/hr. How fast is the distance between them changing at 2pm?

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3. Find the following derivatives:

(i) $\frac{d}{dx} \left(\frac{x}{3 + |x|} \right)$

(ii) $\frac{d}{dx} \sqrt{\arctan(x^2)}$

4. Use the δ - ϵ definition of limit to verify that $\lim_{x \rightarrow 4} \sqrt{x} = 2$.