

(1) [5 points] Differentiate:

$$y = 2^{\sin(\pi x)}$$

(2) [5 points] Use logarithmic differentiation to find the derivative:

$$y = (\cos x)^x$$

(3) [5 points] At 12:00 ship A is 100 km west of ship B. Ship A is sailing south at 35 km/h and ship B is sailing north at 25 km/h. How fast is the distance between the ships changing four hours later?