Thin Film Stress For Ahmed

A critical angle for light travelling from mineral oil into air is measured at 56.4°. A thin film of the same mineral oil is between air and water. What is the minimum thickness of film which will provide dark reflection interference on 500 nm light?

Crit angle so $\theta r = 90^{\circ}$ And then $n_{oil} = 1.20$	DARK = destructive With 2 phase shifts they factor out so destructive
Then check for phase shifts:	means extra distance = odd half λ
n _{air} < n _{oil} so yes,	2 thickness = $\frac{1}{2}\lambda$
then n _{oil} < n _{water} so yes again	Thickness = λ / 4 = 125 nm

A thin sliver of air is trapped between layers of glass. What is the smallest thickness of the air if bright lines are seen using 650 nm light?

Check for phase shifts:	BRIGHT = constructive
n _{glass} > n _{air} so no,	With 1 phase shifts situation is reversed which
then n _{air} < n _{glass} so yes	means extra distance = odd half λ
1 phase shift	2 thickness = $\frac{1}{2} \lambda$
	Thickness = λ / 4 = 163 nm

One day while walking down the street you looked at an oil slick on water and noticed the pattern below:

Explain why.

