



max if $1.5 - x = n(0.34) \quad x \in (.1, 1.5)$

$n=1$:	$x = 1.5 - .34 = 1.16$	$\leftarrow \boxed{1.5 \quad n=0}$
$= 2$	$.82$	
$= 3$	$.48$	
$= 4$	$.14$	

min if $1.5 - x = (n + 1/2)(.34)$

$n=0$	$x = 1.5 - (.34)(.5) = 1.33$
	$.99$
	$.65$
	$.31$



(9) dark: $d \sin \theta = (n - 1/2) \lambda$
 $R \tan \theta = y$

$\lambda = 500 \text{ nm}$
 $R = 75 \text{ cm}$
 $d = .45 \text{ mm} = 450 \mu\text{m}$

$R \frac{(n - 1/2) \lambda}{d} = y$

} small angle should be OK
 $\sin \theta \approx \tan \theta$

$y_2 = .225 \text{ cm}$
 $y_3 = .208$
 $\underline{\quad\quad\quad}$
 $.083 \text{ cm}$

(20) $R = .9 \text{ m}$ $\lambda = 660 \text{ nm} = 260 \mu\text{m}$
 $d = .26 \text{ mm} = 260 \mu\text{m}$

$\cos^2 \phi/2 = 1/2 \Rightarrow \phi = 90^\circ = \frac{\pi}{2} = \frac{2\pi d \sin \theta}{\lambda} \approx \frac{2\pi d}{\lambda} \frac{y}{R}$

$y = \frac{1}{4} \frac{\lambda R}{d} = \frac{1}{4} \frac{.66}{260} .9 \text{ m} = .57 \text{ mm}$

min is $\phi = 180^\circ \rightarrow \Rightarrow 2x \text{ above } 1.14 \text{ mm}$