9) $\theta_{ic} = 45°$ $n = ?$ $\sin\theta_{ic} = \frac{1}{n}$

$\sin 45 = \frac{1}{n}$

$0.7071 = \frac{1}{n}$

$n = \frac{1}{0.7071}$ $\boxed{n = 1.4}$

10) $\theta_1 = 23.5°$ $n_1 = 1.00$ (air)

$\theta_2 = 16.8$

$n_1 \sin\theta_1 = n_2 \sin\theta_2$

$1(\sin 23.5°) = n_2(\sin 16.8)$

$0.398749 = n_2(0.2890317)$

$\div 0.2890317$ $\div 0.2890317$

$\boxed{1.4 = n_2}$

UNIT 7
Review for Final Exam

Formulas

$\frac{1}{d_i} + \frac{1}{d_o} = \frac{1}{f}$ $n = \frac{c}{v}$ $\sin\theta_{ic} = \frac{1}{n}$

$n_1 \sin(\theta_1) = n_2 \sin(\theta_2)$

$n_{Air} = 1.00$ $c = 3.00 \times 10^8$ m/s

1) $d_i = d_o$ $\therefore \frac{1}{d_i} + \frac{1}{d_o} = \frac{1}{f} \rightarrow \frac{1}{d_i} + \frac{1}{d_i} = \frac{1}{f}$

$\frac{1}{d_i} + \frac{1}{d_i} = \frac{1}{f} \rightarrow \frac{2}{d_i} = \frac{1}{f} \rightarrow 2f = d_i \rightarrow \boxed{f = \frac{1}{2} d_i}$

revised Jan 28

2) $d_o = 10\text{cm} \times \frac{1\text{m}}{100\text{cm}} = 0.10\text{m}$

$f = 15.0\text{cm} \times \frac{1\text{m}}{100\text{cm}} = 0.15\text{m}$

$\frac{1}{0.15} + \frac{1}{d_i} = \frac{1}{0.10} \rightarrow \frac{1}{d_i} = \frac{1}{0.15} - \frac{1}{0.10}$

$\frac{1}{d_i} = 6.667 - 10 \rightarrow \frac{1}{d_i} = 3.33$

$d_i = \frac{1}{3.333} = \boxed{0.30\text{m} = d_i}$ or 30cm

3) $n_1 = 1.00$
$\theta_1 = 10.0°$
$n_2 = 2.42$

$n_1 \sin(\theta_1) = n_2 \sin(\theta_2)$

$1(\sin 10°) = 2.42(\sin \theta_2)$

$0.1736 = 2.42(\sin \theta_2)$
$\div 2.42 \quad \div 2.42$

$0.0718 = \sin \theta_2$

$\sin^{-1}(0.0718) = \theta_2$

$\boxed{4.11° = \theta_2}$

4) $\sin \theta_{ic} = \frac{1}{n}$ $\quad n = 1.800$

$\sin \theta_c = \frac{1}{1.8} \rightarrow \sin \theta_c = 0.55\overline{5}$

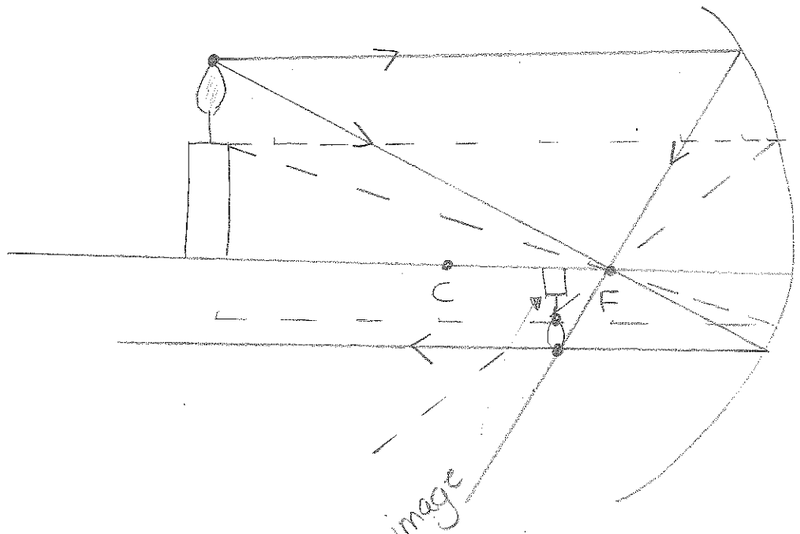
$\theta_c = \sin^{-1}(0.55\overline{5})$

$\boxed{\theta_c = 33.7°}$

5) A diverging lens is a concave lens where entering rays are diverted from the normal axis.
A converging lens is a convex lens where entering rays are converged to a focal point.

6) principal axis E
Vertex A
Focal Point F
Centre of curvature B
Radius of curvature D
Focal Length C

7)



8) $d_o = 6.0\,m$
$d_i = 3.0\,m$
$f = ?$

$\frac{1}{d_i} + \frac{1}{d_o} = \frac{1}{f} \rightarrow \frac{1}{3} + \frac{1}{6} = \frac{1}{f} \rightarrow \frac{2}{6} + \frac{1}{6} = \frac{1}{f} = \frac{3}{6} = \frac{1}{2} = \frac{1}{f}$

$\frac{1}{2} = \frac{1}{f} \rightarrow \boxed{f = 2.0\,m}$