P #12

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$n_1 = 1.00$ (air)
$n_2 = 1.333$ (water)
$n_3 = 1.52$ (glass)

$\lambda_1 = 436$ nm

f is constant, so $\frac{v_1}{\lambda_1} = \frac{v_2}{\lambda_2}$

a) $n_2 = \frac{c}{v_2}$ $\quad (1.333) = \frac{(3 \times 10^8 \text{ m/s})}{v_2}$

$v_2 = 2.26 \times 10^8$ m/s

$\frac{v_1}{\lambda_1} = \frac{v_2}{\lambda_2}$ $\quad \frac{(3 \times 10^8 \text{ m/s})}{(436 \text{ nm})} = \frac{(2.26 \times 10^8 \text{ m/s})}{\lambda_2}$

$\boxed{\lambda_2 = 328 \text{ nm}}$

b) $n_3 = \frac{c}{v_3}$ $\quad (1.52) = \frac{(3 \times 10^8 \text{ m/s})}{v_3}$

$v_3 = 1.97 \times 10^8$ m/s

$\frac{v_1}{\lambda_1} = \frac{v_3}{\lambda_3}$ $\quad \frac{(3 \times 10^8 \text{ m/s})}{(436 \text{ nm})} = \frac{(1.97 \times 10^8 \text{ m/s})}{\lambda_3}$

$\boxed{\lambda_3 = 287 \text{ nm}}$