Ex 1

1. $\dfrac{YN}{YV} = \dfrac{YS}{YX} = \dfrac{NS}{VX} \Rightarrow \dfrac{YN}{5,4} = \dfrac{YS}{2,7} = \dfrac{2,9}{6,5}$

Donc $YN = \dfrac{2,9}{6,5} \times 5,4 = 2,4 \text{ cm}$

$YS = \dfrac{2,9}{6,5} \times 2,7 = 1,2 \text{ cm}$

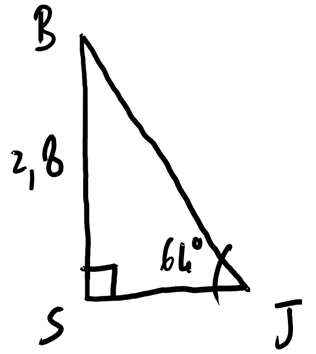
2. $\dfrac{RP}{RX} = \dfrac{RF}{RE} = \dfrac{PF}{EX} \Rightarrow \dfrac{RP}{2,6} = \dfrac{3,5}{RE} = \dfrac{6}{3,7}$

Donc $RP = \dfrac{6}{3,7} \times 2,6 = 4,2 \text{ cm}$

$\dfrac{3,5}{RE} = \dfrac{6}{3,7} \Rightarrow \dfrac{RE}{3,5} = \dfrac{3,7}{6} \Rightarrow RE = \dfrac{3,7}{6} \times 3,5 = 2,2 \text{ cm}$

Ex 2

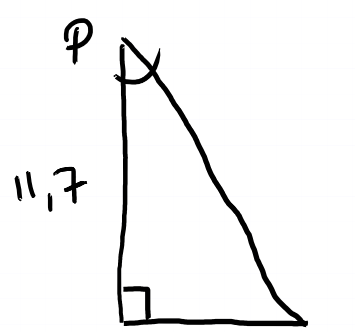
1.



$SB = JB \times \sin \hat{J} \Rightarrow JB = \dfrac{SB}{\sin \hat{J}}$

Donc $JB = \dfrac{2,8}{\sin 64} = 3,1 \text{ cm}$

2.



$\tan \hat{P} = \dfrac{opp}{adj} = \dfrac{TN}{TP} = \dfrac{9,6}{11,7}$

$\hat{P} = \arctan\left(\dfrac{9,6}{11,7}\right) = 39,4°$

Ex 3

1. $BD^2 = CD^2 - BC^2 = 8{,}5^2 - 7{,}5^2 = 16$

$BD = \sqrt{16} = 4\text{ cm}$

2. $\dfrac{FE}{BD} = \dfrac{3{,}2}{4} = 0{,}8$; $\dfrac{FB}{BC} = \dfrac{6}{7{,}5} = 0{,}8$; $\dfrac{BE}{CD} = \dfrac{6{,}8}{8{,}5} = 0{,}8$

Donc CBD et BEF sont semblables.

3. CBD et BEF sont semblables ;

$C\hat{B}D$ et $B\hat{F}E$ sont correspondants ;

$C\hat{B}D = 90°$ => $B\hat{F}E = 90°$

En plus : $6^2 + 3{,}2^2 = 36 + 10{,}24 = 46{,}24 = 6{,}8^2$

=> $FB^2 + FE^2 = BE^2$ => $B\hat{F}E = 90°$ => <u>Oui</u>

4. $A\hat{C}D = A\hat{C}B + B\hat{C}D = 61° + B\hat{C}D$

$\cos B\hat{C}D = \dfrac{7{,}5}{8{,}5}$ => $B\hat{C}D = \arccos\left(\dfrac{7{,}5}{8{,}5}\right) = 28°$

Donc $A\hat{C}D = 61° + 28° = 89° \neq 90°$ => <u>Non</u>

Ex 4

1. $BD^2 = BC^2 + CD^2 = 1{,}5^2 + 2^2 = 6{,}25$

$\Rightarrow \quad BD = \sqrt{6{,}25} = 2{,}5$ Km

2. Les angles $\widehat{BCD}$ et $\widehat{DEF}$ sont alterns interns

et $\widehat{BCD} = \widehat{DEF} = 90°$ $\Rightarrow$ $(BC) // (EF)$

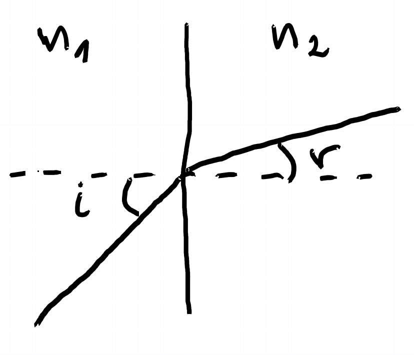
3. Les triangles BCD et DEF sont semblables.

Thalès: $\dfrac{DF}{BD} = \dfrac{DE}{DC} \Rightarrow \dfrac{DF}{2{,}5} = \dfrac{5}{2}$

$\Rightarrow \quad DF = \dfrac{5}{2} \times 2{,}5 = 6{,}25$ Km

4. $7 + 2{,}5 + 6{,}25 + 3{,}5 = 19{,}25$ Km

Ex 5



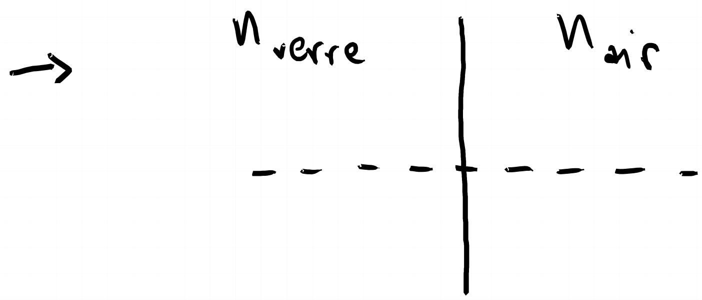
$n_1 \sin i = n_2 \sin r$

Ex 6

$c = 3 \times 10^8 \ ms^{-1} \rightarrow$ vide $\qquad V \rightarrow$ célérité dans le verre

$n_{verre} = \dfrac{c}{V} \Rightarrow V = \dfrac{c}{n_{verre}} = \dfrac{3 \times 10^8}{1{,}5} = 2 \times 10^8 \ ms^{-1}$

Ex 7



1. $n_{verre} \sin i = n_{air} \sin r$

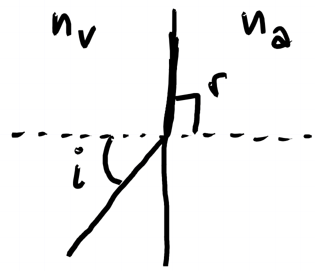
$i = 30°$ $n_{verre} = 1{,}5$ $n_{air} = 1$

$1{,}5 \times \sin 30° = 1 \times \sin r$

$\Rightarrow \sin r = 1{,}5 \times \sin 30°$

$r = \arcsin(1{,}5 \times \sin 30°) = 48{,}6°$

2. L'angle limite de réfraction est l'angle d'incidence quand $r = 90°$.



$n_v \sin i = n_a \sin r$

$1{,}5 \sin i = 1 \sin 90°$

$1{,}5 \sin i = 1 \Rightarrow \sin i = \frac{1}{1{,}5}$

Donc $i = \arcsin\left(\frac{1}{1{,}5}\right) = 41{,}8°$