Agua

B

Aceite (sg = 0.90)

A

h1

h2

h3

h4

h5

Mercurio (sg = 13.54)

B

WATER

OIL

A

h_1

h_2

h_3

h_4

h_5

6

8

10

6

6 IN

Hg

Hg

$SG_{Hg} \rightarrow$ | 13.56 |

$$P_B + \gamma_w \cdot h_1 + \gamma_{Hg} h_2 - \gamma_w \cdot h_3$$
$$+ \gamma_{Hg} h_4 - \gamma_o \cdot h_5 - P_A = 0$$

$$(P_B - P_A) = -(\gamma_w h_1 + \gamma_{Hg} h_2 - \gamma_w h_3$$
$$+ \gamma_{Hg} h_4 - \gamma_o h_5)$$

$$\gamma_w = 9.8 \frac{kPa}{m}$$
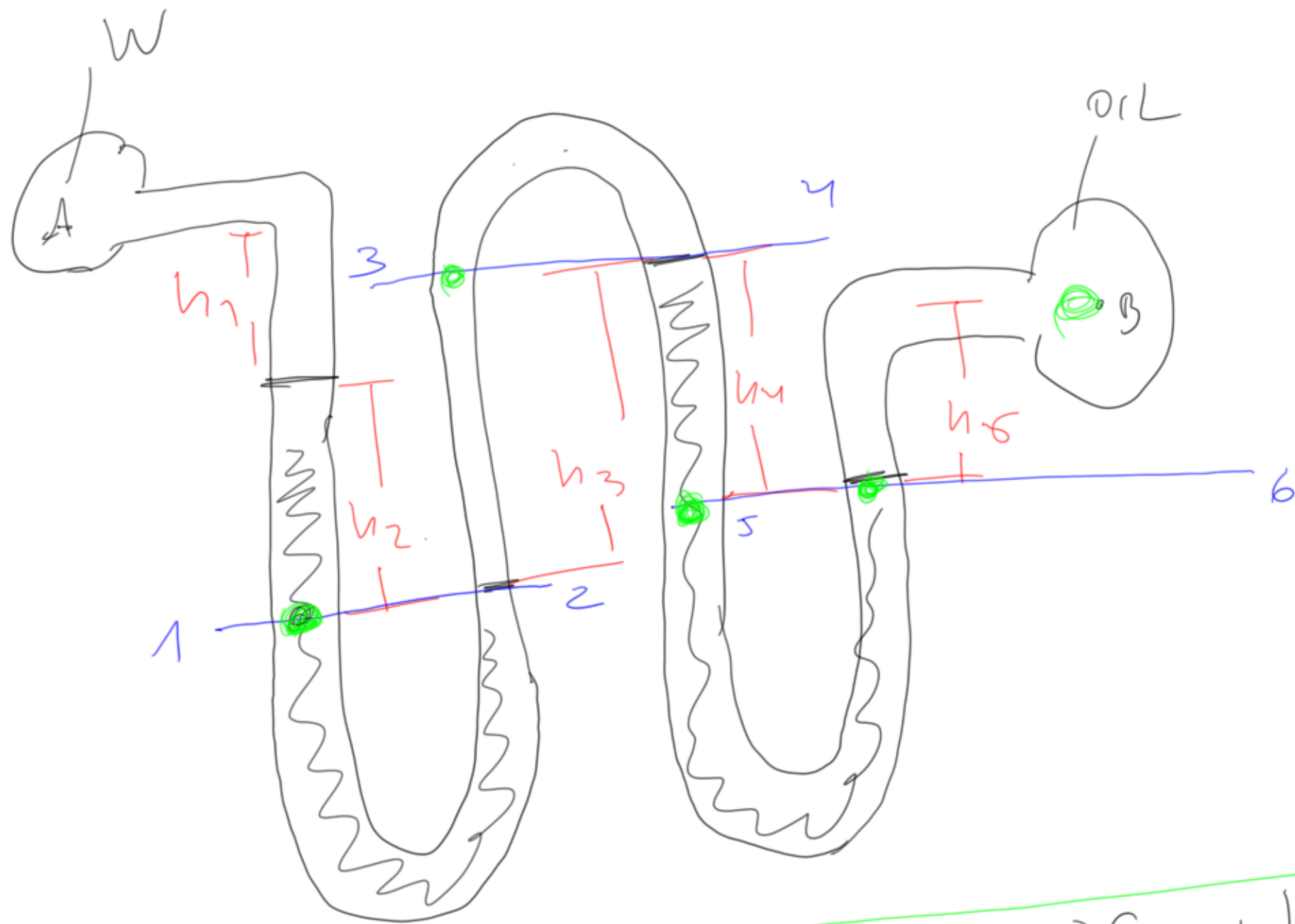
$$\gamma_{Hg} = SG_{Hg} \cdot \gamma_w = 13.56 \cdot \frac{9.8 \, kPa}{m}$$

$$\gamma_o = SG_o \cdot \gamma_w = 0.9 \cdot 9.8 \frac{kPa}{m}$$

Forma 2 de resolución

$$P_A - P_B = -\gamma_W\left(h_1 + h_2 SG_{Hg} - h_3 + h_4 SG_{Hg} - h_5 SG_{oil}\right)$$

$$= -\gamma_W\left(6 + 6 \cdot 13.56 - 10 + 8 \cdot 13.56 - 6 \cdot 0.9\right)$$

$\underbrace{\qquad\qquad\qquad\qquad\qquad}_{\text{INCH}}$

$$= -\gamma_W \cdot (180.44 \text{ in})$$

$$= -9.8 \frac{kPa}{m} \cdot 180.44 \text{ in} \cdot \left[\frac{2.54 \text{ cm}}{1 \text{ in}}\right] \cdot \left[\frac{1 \text{ m}}{100 \text{ cm}}\right]$$

$$= -44.9 \text{ kPa}$$

W

A

OIL

B

3

4

6

5

2

1

h_1, h_4, h_5, h_3, h_2

Forma 1 de resolucion

$P_1 = P_2$

$P_1 = P_A + h_1 \gamma_w + h_2 \gamma_{Hg}$

$P_2 = P_1 = P_3 + h_3 \cdot \gamma_w$

$P_3 = P_4$

$P_5 = P_3 + h_4 \cdot \gamma_{Hg}$

$P_5 = P_6 = P_B + h_5 \gamma_0$

$P_A + h_1 \gamma_w + h_2 \gamma_{Hg} = P_3 + h_3 \gamma_w$ ①

$P_3 = \boxed{P_5} - h_4 \gamma_{Hg} = P_B + h_5 \gamma_0 - h_4 \gamma_{Hg}$ ②