Q1. A clinician reads a blood pressure of **120 mmHg**. What height of **water (cm H_2O)** produces the same pressure?
Answer: 163.2 cm H_2O.
Solution: Use density ratio: $h_{water}=(\rho_{Hg}/\rho_{water}) \cdot h_{Hg}$
With $\rho_{Hg}=13.6$, $h_{Hg}=$ 12 cm (120 mm = 12 cm)

$h=13.6\times12=$ 163.2 cm.

Q2. Convert **120 mmHg** to **Pascals (N/m^2)** using the lecture's atmospheric calculation. (Use the relation from the notes where 1 atm ≈ 101292.8 N/m^2 and 760 mm = 1 atm.)
Answer: ≈ 1.599×10^4 Pa (≈ 1.60×10^4 N/m^2).
Solution: 1 mmHg≈101292.8 / 760 Pa≈133.28 Pa

$120\times133.28\approx15993.6$ Pa.

Q3. Using the lecture's units, express the pressure corresponding to **120 mmHg** in **dyne/cm^2**.
Answer: ≈ 1.599×10^5 dyne/cm^2.
1 Pa=10 dyne/cm^2.

From Problem 2: 1.599×10^4 Pa$\times10=1.599\times10^5$ dyne/cm^2=1.599×10^5 dyne/cm^2

Q4, How deep (in meters) must you go in **fresh water** to feel an extra pressure of **30 mmHg** above atmospheric (ignore temperature effects)? Give the depth in meters. (Use $\rho_{water}=1000$ kg/m^3.g = 9.8 m/s^2, and convert 30 mmHg to Pa using 1 mmHg ≈ 133.28 Pa from the notes.)
$P=30\times133.28\approx3998.4$ Pa. Hydrostatic

$P=\rho gh \Rightarrow h=P/(\rho g)=3998.4/(1000\times9.8)\approx0.407$ (≈ 40.8 cm).

Q5. Micturition (the urge to void) typically occurs around **30 cm H_2O** in an adult. What is this pressure in **mmHg**? (Use 1 cm H_2O = 0.735 mmHg from the notes.)

$30\times0.735=22.05$ mmHg.