

1. A fluid sp. gravity = 1.3, what is its density in lbm/gal?

Solution:

$$\rho = (1.3)(8.34) \text{ lbm/gal} = \underline{10.84 \text{ lbm/gal}}$$

2. A fluid  $\rho = 78 \text{ lbm/ft}^3$ . What is its sp. gravity?

Solution:

$$\text{sp. gravity} = \frac{78 \text{ lbm/ft}^3}{62.4 \text{ lbm/ft}^3} = \underline{1.25}$$

3. A fluid  $\rho = 11.5 \text{ lb/gal}$ . What is its  $\rho$  in lbm/bbl?

Solution:

$$\rho = (11.5 \text{ lbm/gal})(42 \text{ gal/bbl}) = 483 \text{ lbm/bbl}$$

4. 10 bbls of material sp. gravity = 4.3. What is its total wt.?

Solution:

$$\begin{aligned} \text{Wt} &= (\rho)(\text{Volume}) \\ &= (4.3)(350 \frac{\text{lbm}}{\text{bbl}})(10 \text{ bbl}) \\ &= 15050 \text{ lbm} \end{aligned}$$

5. A 9.4 lbm/gal mud column @ 3500 ft. What pressure it exerts at this depth?

Solution:

$$\begin{aligned} \text{Psi} &= (\text{sp. gravity})(0.433)(\text{height}) \\ &= \frac{9.4 \text{ lbm/gal}}{8.34 \text{ lbm/gal}} \times 0.433 \times h \\ &= 1708 \text{ psi} \end{aligned}$$

6. A 10" x 20" single acting, single cylinder pump operate at 40 strokes/min. What is  $Q_{out}$ ?

Solution:

$$\begin{aligned} D &= 10'' \\ S &= 20'' \end{aligned}$$

Then

$$\begin{aligned} PD &= \frac{0.7854}{144} (D^2) \left(\frac{S}{12}\right) (7.48) (N) \\ &= \frac{0.7854}{144} (10^2) \left(\frac{20}{12}\right) (7.48) (40) \\ &= 272 \text{ gal/min} \end{aligned}$$