3.6 The value for the absolute pressure will always be greater than that for the gage pressure.

This is TRUE. The gage pressure is the pressure in that gage relative to the absolute pressure (abs pressure is gage pressure plus atmospheric pressure). The absolute pressure is relative to the minimum possible. It's like saying that Kelvin will always be *more* than Celsius.

3.7 As long as you stay on the surface of the Earth, the atmospheric pressure will be 14.7 psia.

This is FALSE. The surface of the earth exists at points on high mountains or crazy wind/weather and some places have high pressure (I googled this one after the fact, someplace in Siberia set the record in the 60s for naturally occurring on land, sea level even). It varies with wind, heat, and elevation, and it's always changing because neighboring regions are changing and pressure fluctuates. It's part of how the weather works I think!

3.8 The pressure in a certain tank is 53.6 Pa(abs)

This is TRUE. It would be a tank with a pretty crazy vacuum, normal atm pressure is like 101kPa, that is over 100,000 pascals, so it would be fighting the atmosphere to not implode unless it was in space, then the differential would be about the pressure of the tank, space atm pressure is about 0? In a normal environment, it would be a vacuum tank

3.9 The pressure in a certain tank is 4.65 psig

This is TRUE. 4.65 gage pressure just shows pressure in a tank. It's a relative pressure to the tank.

3.10 The pressure in a certain tank is 175 kPa (gage)

This is True. It's been done, it's just a normal tank above atm pressure, which is 101 kPa. Its absolute pressure would be about 276 kPa if it was a typical day

3.11 What is the atmospheric pressure at 4000 ft above sea level, on a typical day

I found 2 great formulas on the Glenn Research Center NASA website that work great for elevations under 36000ft,

$Temp = 59 - .00356h$ and $Pressure = 2116 * [\frac{T+45\ .7}{518.6}]^{5.256}$, Where T is the temp in Fahrenheit, h is height in feet, and pressure will be given in lbs per square FOOT, so it needs to be converted.

At 4000 ft,

$$Temp = 59 - .00356 * 4000ft = 44.76\ degrees\ farenheit$$

And,

$$Pressure = 2116 * [\frac{44.76F + 459.7}{518.6}]^{5.256} = 1829.8\ \frac{lb}{ft^2}\left(\frac{1\ sq\ ft}{144\ sq\ in}\right) = 12.7\ psi$$

3.13 Expressed as a Gage pressure, what is the pressure at the surface of a glass of milk?

I feel like this is a 'trick' question. At the surface of any body of liquid, where the surface is interfacing with the atmosphere, the pressure is equal to the atmospheric pressure. It's a pressure

taken at the “**surface**”. The gage pressure would be zero, the milk is exerting no pressure along the top of the glass, it increases as it goes down though! You do a deltaP=specific weight* height change, using the specific weight of milk, but its height change is zero here, its surface. So zero Gage pressure.