CALCULATE DENSITY ALTITUDE

To calculate density altitude, begin with the following equation:

DA = PA + [120 (OAT – ISA)]

DA is density altitude

PA is pressure altitude

OAT is outside air temperature

ISA is standard temperature at the calculated pressure altitude

To complete the density altitude calculation you will first need to calculate the pressure altitude. The equation for calculating pressure altitude is:

PA = (29.92 – Barometric Pressure) 1,000 + Elevation

You will also need to calculate the ISA. Because the standard lapse rate is 2 degrees C per 1,000 feet of elevation, you can use the following equation:

ISA = 15 - (2 / 1,000 x PA)

DIRECTIONS

Use the data provided to calculate the density altitude.

Airport Elevation - 4,142 ft

Pressure - 30.40 ”Hg

Temperature - 32 °C

1. Calculate the pressure altitude. Use the equation: PA = (29.92 – Barometric Pressure)1,000 + Elevation. Remember that the standard pressure lapse rate is 1”Hg per 1,000 feet.

   PA = (29.92 - 30.40) 1,000 + 4,142

   The pressure altitude is 3,662 feet.

2. Calculate the ISA at the given pressure altitude to determine the density altitude correction. Remember that the standard temperature lapse rate is 2 °C per 1,000 feet.

   ISA = 15 - (2 / 1,000 x PA)

   ISA = 15 - (2 / 1,000 X 3,662)

   The ISA is 7.7°C, but for our purposes we can round that to 8°C.

3. Plug the calculated pressure altitude and temperature ito the density altitude formula.

   DA = PA + [120(OAT – ISA)]

   DA = 3,662 + [120 (32 – 8)]

   DA = 3,662 + 2,880

   The result is 6,542 feet.