Instructions

This worksheet explores how altimeters work in aviation and the relationship between temperature differences and altitude. Answer the questions to the best of your ability. Show your calculations where required. 1. An aviation altimeter measures altitude by detecting changes in atmospheric pressure. Explain what an altimeter is and how it works in aviation.

2. If the outside air temperature is warmer than the reference temperature used by the altimeter, how does this affect the altimeter's reading compared to the actual altitude?

3. An altimeter is set to a reference pressure of 29.92 inches of mercury at sea level. If the air temperature increases by 15°C at a certain altitude, what happens to the aircraft's indicated altitude compared to its true altitude? Explain the relationship.

4. Calculate the altitude correction due to temperature differences using the formula: h = h_ref - (temperature difference × 12) Where: - h = actual altitude - h_ref = indicated altitude (from altimeter) - temperature difference = actual temperature - reference temperature For example, if the indicated altitude is 5,000 feet and the temperature is 15°C warmer than the reference temperature (ISA), what is the actual altitude? Show your work.

5. Explain why it is important for pilots to adjust the altimeter for temperature differences, especially during landing.

6. At what temperature deviation from ISA (International Standard Atmosphere) would the altimeter's indicated altitude differ by 1,000 feet from the actual altitude? Use the formula provided and solve for the temperature difference.

7. A pilot observes that the altimeter indicates 10,000 feet, but the air temperature is 20°C warmer than ISA at that altitude. What is the actual altitude? Use the formula to calculate the difference.

8. Discuss how real-world pilots use altimeters and temperature data to ensure accurate altitude readings during flights.

We hope you enjoyed learning about the relationship between altimeters, temperature, and altitude! Aviation math is full of fascinating challenges like this. Keep exploring! ✈