Flying by numbers – worksheet

1. Rearrange the lift formula to make the wing area the subject.

2. An aircraft designer is designing a small jet. It needs to have a lift of 24,000kg and a cruising speed of 100 m s^{-1} at an altitude where the air density is 1.5kg m^{-3}. The coefficient of lift will be 1.3. calculate the minimum wing area that the new jet will need.

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3. Rearrange the lift formula to make the velocity the subject

4. An aircraft has a mass of 36,120kg, a wing area of 80m^2 and a coefficient of lift of 0.2. calculate the velocity needed to achieve level flight at an altitude where the air density is 1.6kg m^{-3}. (hint@ for level flight, lift = weight)

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5. An aircraft with a mass of 147,300kg is flying at an altitude of 5000m. It has a coefficient of lift of 1.2 and the surface area of the wing is 200m^2. Calculate the velocity needed for level flight.

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6. A Boeing 777 if flying at an altitude of 10,000m at a velocity of 240m s^{-1}. Assuming that the aircraft is at the maximum take-off weight, determine the angle of attack necessary for it to maintain level flight.

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