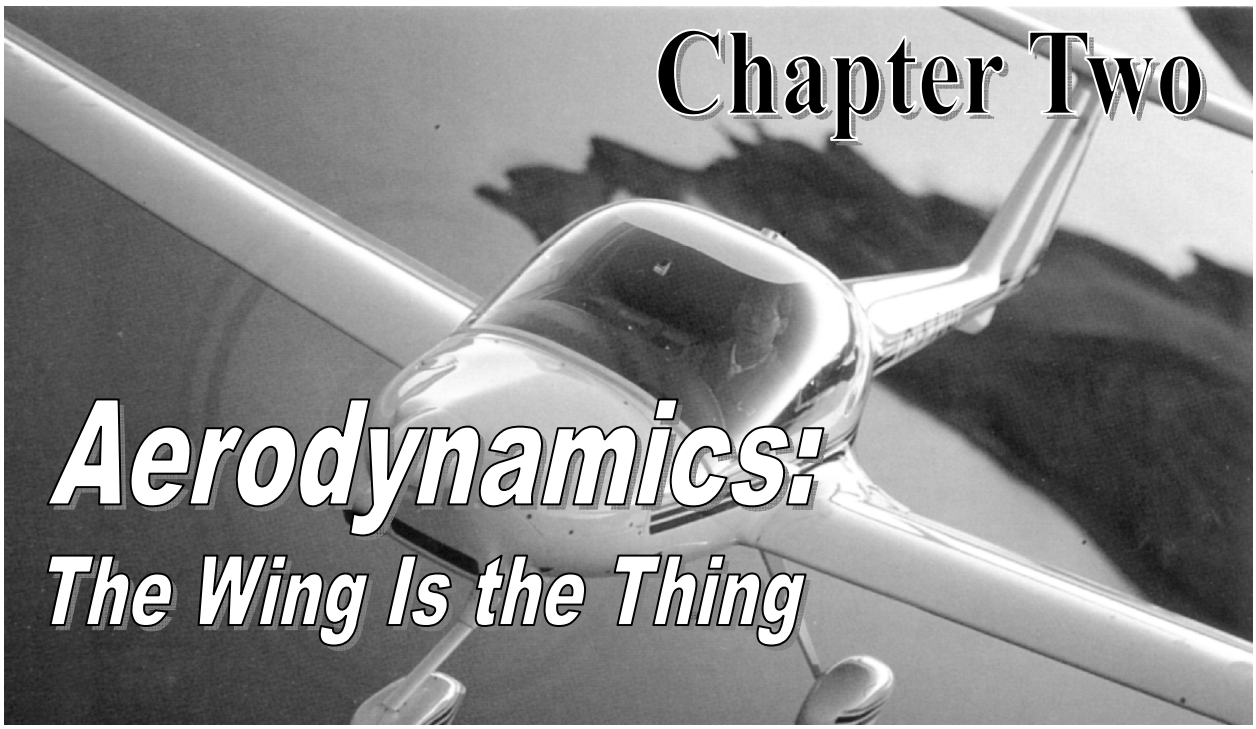
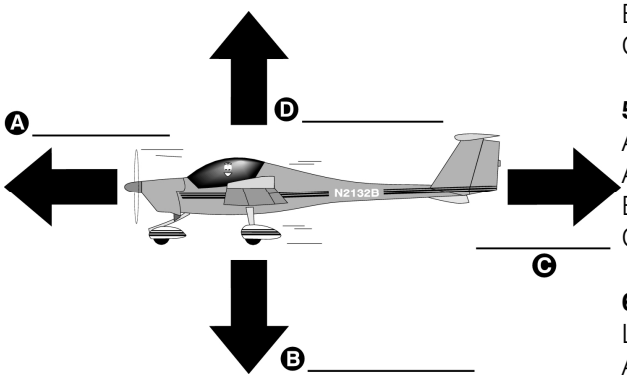


May the Four Forces Be With You

May the Four Forces Be With You

1. [2-1/3/2]
The four forces acting on an airplane in flight are
A. lift, weight, thrust, and drag.
B. lift, weight, gravity, and thrust.
C. lift, gravity, power, and friction.

2. [2-1/Figure 1] Fill in the four forces:



3. [2-2/2/2]
When are the four forces that act on an airplane in equilibrium?
A. During unaccelerated flight.
B. When the aircraft is accelerating.
C. When the aircraft is in a stall.

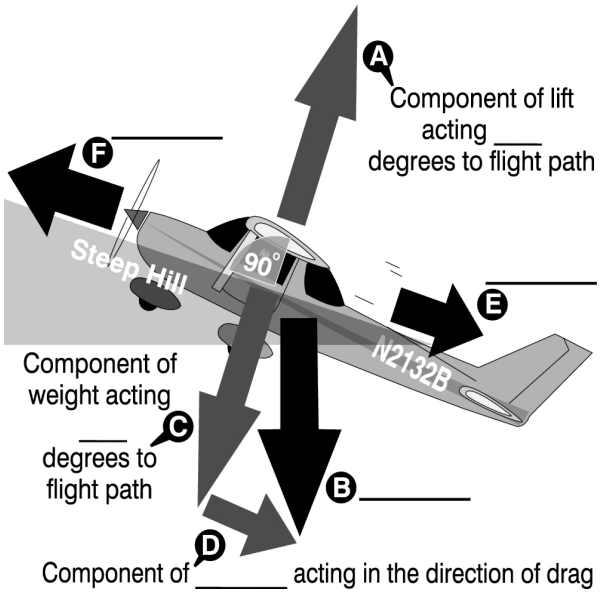
4. [2-2/2/2 & 2-2/3/2]
What is the relationship of lift, drag, thrust, and weight when the airplane is in straight-and-level flight?
A. Lift equals weight and thrust equals drag.
B. Lift, drag, and weight equal thrust.
C. Lift and weight equal thrust and drag.

5. [2-3/2/1]
Airplanes climb because of _____
A. excess lift.
B. excess thrust.
C. reduced weight.

6. [2-4/Figure 5]
Lift acts at a _____degree angle to the relative wind.
A. 180
B. 360
C. 90

Climbs

7. [2-4/Figure 5] Fill in the blanks for the forces in a climb:

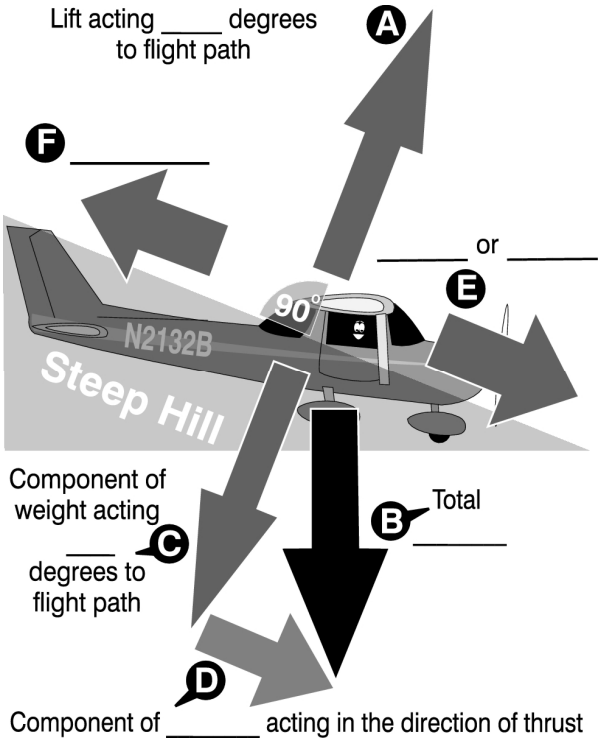


8. [2-4/3/3]
The minimum forward speed of the airplane is called the _____ speed.
A. certified
B. stall
C. best rate of climb

9. [2-5/3/1]
You can determine the proper climb attitude for your airplane by referring to the
A. attitude indicator.
B. airspeed indicator.
C. vertical speed indicator.

Descents

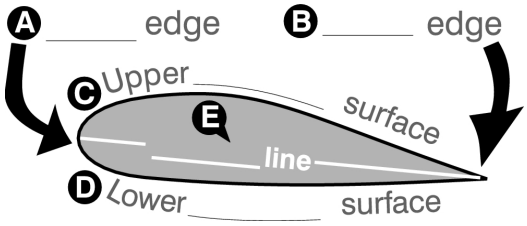
10. [2-6/Figure 9] Fill in the blanks for the forces in a descent



The Wing and Its Things

Defining the Wing

11. [2-7/Figure 10] Fill in the parts of the wing:



12. [2-7/1/4]
The chord line is an imaginary line connecting the
A. trailing edge of the wing with the leading edge.
B. leading edge of the wing with the trailing edge.
C. wing root with the wing tip.

13. [2-7/2/1]
The chord line is used to represent
A. the general shape of the wing.
B. the sound the wing makes when it moves in air.
C. the average width of the wing.

How the Wing Works

14. [2-72-7/3/1]
The definition of chord enables us to understand
A. how the wing moves through the air.
B. how to preflight the airplane.
C. the angle the wind meets a wing that may vary in size and shape.

Relative Wind

15. [2-8/1/2]
Relative wind results from the motion of the
A. airplane's thrust.
B. airplane through the air.
C. wind blowing on the airplane.

16. [2-8/1/2]
Relative wind is called relative because it
A. results from the motion of the airplane.
B. is perpendicular to the airplane's flight path.
C. is independent of airplane motion.

17. [2-8/1/2]
Relative wind is _____ and _____ to the airplane's motion.
A. tangential to, equal
B. opposite to, perpendicular
C. opposite to, equal

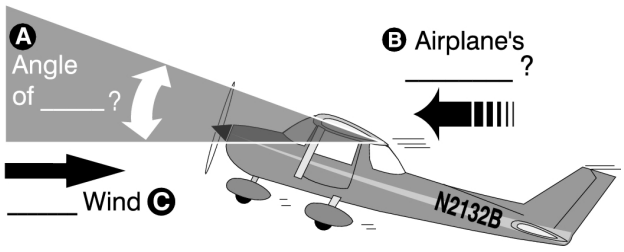
18. [2-8/3/2]
Relative wind is _____ which way the airplane's nose is pointed.
A. dependent on
B. indifferent to
C. independent of

Attacking the Air

19. [2-9/2/1]
The term "angle of attack" is defined as the angle
A. between the wing chord line and the relative wind.
B. between the airplane's climb angle and the horizon.
C. formed by the longitudinal axis of the airplane and the chord line of the wing.

20. [2-9/1/2]
An important principle to understand when dealing with angle of attack is that the nose (therefore the wing) can be pointed on an incline that's _____ the actual climb path.
A. different from
B. always the same as
C. always parallel to

21. [2-9/Figure 14] Label wing and wind components:



22. [9/2/1]
Angle of attack is defined as the angle between the chord line of an airfoil and the
A. direction of the relative wind.
B. pitch angle of an airfoil.
C. rotor plane of rotation.

How Lift Develops

23. [2-9/3/2]
Wings are expressly built to plow through air molecules separating them either above or below while offering little resistance in the _____ direction.
A. vertical
B. horizontal
C. perpendicular

Impact Versus Pressure Lift

24. [2-10/1/3]
Wind deflected downward by the airfoil creates a/an _____ movement of the wing.
A. downward
B. sideways
C. upward

Bending the Wind with the Wing

25. [2-11/1/2]
Bernoulli figured out that the faster the air flows over a surface, the _____ pressure it exerts on that surface.
A. less
B. more
C. higher the

26. [2-11/2/1] Fill in the blank:
Air flowing faster over a curved surface causes a slight _____ in pressure on that surface.

27. [2-11/2/1]
High velocity airflow over the wing causes a slight decrease in pressure on the wing's upper surface. In other words, the pressure on _____ of the wing is now _____ than the pressure on bottom of the wing.
A. the side, greater
B. top, less
C. top, greater

28. [2-12/1/1]
Since high pressure always moves toward low pressure, the wing (which just happens to be in the way) is pushed _____ in the process.
A. horizontally
B. downward
C. upward

29. [2-12/1/2]
Because of the wing's shape, even at a very small angle of attack, a cambered wing still adds a slight curve and _____ to the wind.
A. acceleration
B. deceleration
C. crossflow parameter

Angle of Attack and the Generation of Lift

30. [2-12/2/1]
At a relatively slow speed (such as during takeoff), the wing's engineered curve isn't capable of curving or deflecting enough air _____ to produce the necessary lift for flight.
A. upward
B. sideways
C. downward

31. [2-12/1/2]
Raising the nose slightly increases the angle of attack which forces the air to undergo an additional _____ greater than that which the _____ of the airfoil can produce.
A. curve, engineered shape
B. deceleration, creator
C. acceleration, pilot

32. [2-12/2/2]
An increased angle of attack permits the airplane to produce the necessary lift for flight at a _____ airspeed.
A. faster
B. constant
C. slower

33. [2-12/2/2]
As the angle of attack increases, an airplane can fly at a _____ speed and still develop the necessary lift for flight.
A. slower
B. constant
C. faster

STALLS

Stall, Angle of Attack & How the Nose Knows

34. [2-14/1/3]
As the angle of attack exceeds approximately 18 degrees the air molecules flowing over the wing don't negotiate the turn very well. When this happens, they spin off or burble into the free air, no longer providing a uniform, high-velocity, laminar airflow over the wing. The wing _____
A. develops lift.
B. experiences an increase in drag.
C. stalls.

35. [2-14/1/3]
When the critical angle of attack is exceeded, the airplane will
A. stall.
B. ascend.
C. descend.

36. [2-14/1/6]
All wings
A. have a critical angle of attack.
B. produce equal amounts of lift at all angles of attack.
C. have a bird that they belong to.

37. [2-14/1/6]
The direct cause of every stall is excessive
A) angle of attack.
B) density altitude.
C) upward vertical velocity.

38. [2-15/2/3]
If the wing stalls, you need to do one very important thing:
A. apply back pressure to reduce the angle of attack.
B. increase the angle of attack.
C. reduce the angle of attack to less than its critical value.

39. [2-15/2/3]
You can unstall a wing by _____ the angle of attack.
A. increasing
B. reducing
C. ignoring

Stall at Any Attitude or Airspeed

40. [2-15/3/1]
You should realize that an airplane can be _____ at any attitude or any airspeed.
A. taxied
B. stalled
C. maneuvered

41. [2-15/3/1]
Whether an airplane exceeds its critical angle of attack is independent of
A. attitude or airspeed.
B. relative wind.
C. the angle between the chord line and relative wind.

42. [2-15/3/3]
If an airplane stalls, the first step in recovering is to decrease the angle of attack by moving the elevator control _____ or releasing _____ on the elevator control.
A. forward, side pressure
B. backward, back pressure
C. forward, back pressure

43. [2-16/1/2]
Once the airplane is no longer stalled it should be put back in the desired attitude while making sure you don't _____ again.
A. stall
B. fly
C. accelerate

Five Stall Warning Signs

44. [2-16/2/All, 2-16/3/All, 2-17/1/2 & 3]
Which of the following may indicate the onset of a stall?
A. Improved control response, low nose attitude, noticeable buffeting.
B. Diminished control response, stall horn silent, airspeed in the green.
C. Stall horn sounding, diminished control response, noticeable buffet.

Stalling Speed, Gee Whiz and G-Force

45. [2-17/2/1]
When the weight of an airplane is increased, the airplane stalls at _____ indicated speed.
A. a higher
B. a lower
C. the same

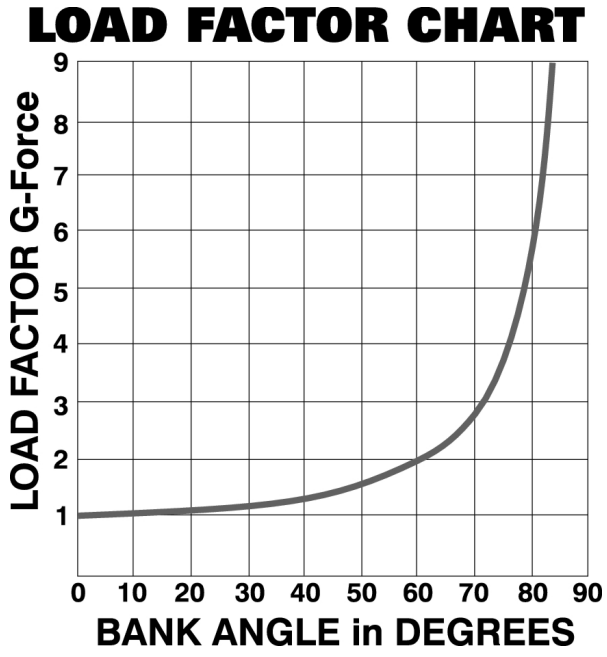
46. [2-17/2/2]
An increase in weight (apparent or real) means the wings must develop more _____ to remain airborne.
A. lift
B. angle beyond its critical value
C. drag

47. [2-17/3/2]
The critical angle of attack at which the wing stalls _____
A. is always changing, based on the airplane's weight.
B. never changes, regardless of airplane weight.
C. changes, based on the airplane's speed.

48. [2-17/3/2]
The angle of attack at which an airplane wing stalls will
A. increase if the CG is moved forward.
B. change with an increase in gross weight.
C. remain the same regardless of gross weight.

49. [2-17/3/2] Fill in the blank:
Increasing an airplane's weight will not affect the _____ of attack at which the airplane stalls.

50. [2-18/2/3]
Which basic flight maneuver increases the load factor on an airplane as compared to straight-and-level flight?
A. A climb.
B. A turn.
C. A stall.



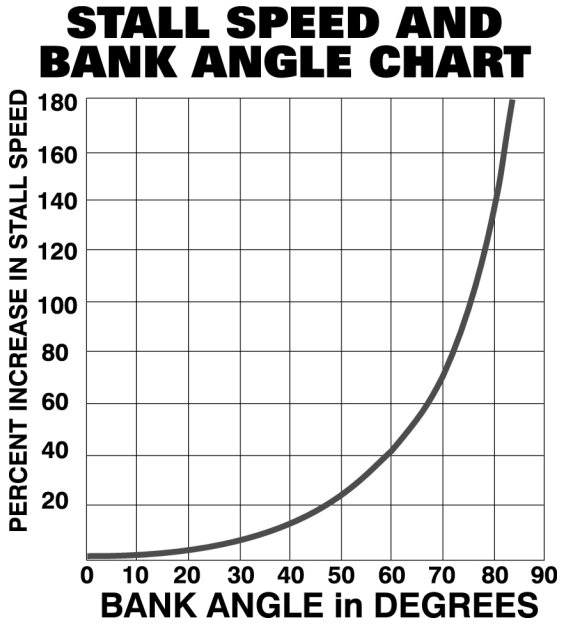
51. [18/3/2]
Referring to the load factor chart above, if an airplane weighs 2,300 pounds, what approximate weight would the airplane structure be required to support during a 60 degree banked turn while maintaining altitude?
A. 2,300 pounds.
B. 3,400 pounds.
C. 4,600 pounds.

52. [2-18/3/2]
Referring to the load factor chart on the previous page, if an airplane weighs 3,300 pounds, what approximate weight would the airplane structure be required to support during a 30 degree banked turn while maintaining altitude?
A. 1,200 pounds.
B. 3,100 pounds.
C. 3,960 pounds.

53. [2-18/3/2]
Referring to the load factor chart on the previous page, if an airplane weighs 4,500 pounds, what approximate weight would the airplane structure be required to support during a 45 degree banked turn while maintaining altitude?
A. 4,500 pounds.
B. 6,750 pounds.
C. 7,200 pounds.

54. [2-18/3/3]
If the airplane "feels" twice as heavy as it actually is, then the lift must _____ if the airplane is to maintain altitude.
A. remain the same
B. decrease
C. double

55. [2-19/1/2,3]
An increased load factor will cause the airplane to
A. stall at a higher airspeed.
B. have a tendency to spin.
C. be more difficult to control.



56. [2-19/2/3 & Figure 32]
Based on the stall speed and bank angle chart above, at a 60 degree bank in level flight, the stall speed increases by
A. 67%
B. 40%
C. 2%

57. [2-20/1/2]
When the bank increases, the nose wants to _____
A. raise up automatically, which puts the airplane near a stall if the pilot doesn't do something.
B. pitch forward, which automatically sends the airplane into a diving, unrecoverable spiral.
C. pitch down, which results in the pilot pulling on the elevator to maintain altitude, causing an increased angle of attack.

58. [2-20/1/3]
Why it important for a pilot to be especially sensitive to the amount of G-force he or she is experiencing while maneuvering the airplane?
A. G-force always causes the airplane to move in a different trajectory than planned by the pilot.
B. Increasing G-force always means an increase in stall speed.
C. G-force can cause embarrassment by pulling a student's dentures out of their mouth.

59. [2-20/1/3]
What are the most important parts of your anatomy for avoiding stalls?
A. Your brain, for planning to avoid steep turns near the ground and your derrière for sensing G-force which helps alert you to an increase in stall speed.
B. Your derrière for thinking and your brain for feeling G-force.
C. Your hands, since they are the things that pulled back on the elevator and got you in trouble in the first place.

DRAG

What a Drag

60. [2-20/2/3]
Drag is the airplane's natural response to an object's movement through the
A. slipstream.
B. wing's downwash.
C. air.

Horizontal and Vertical Movements of Air

61. [2-20/3/3]
Wings are designed to deflect air _____ while offering very little _____ resistance.
A. horizontally, vertical
B. vertically, horizontal
C. sideways, diagonal

62. [2-20/3/4]
The two basic forms of drag are:
A. parasite and induced drag.
B. planform and interference drag.
C. good and bad drag.

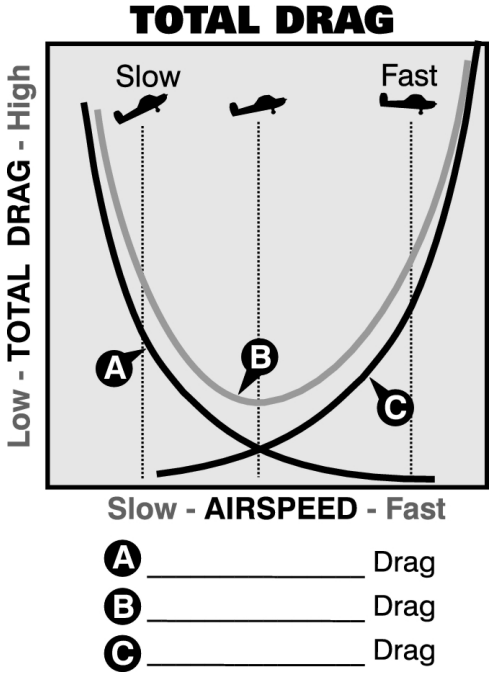
63. [2-21/1/2]
Parasite drag is the result of
A. friction.
B. the development of lift.
C. small bugs living on the wing.

64. [2-21/1/2]
As airspeed doubles, parasite drag _____.
A. doubles
B. triples
C. quadruples

65. [2-21/1/3]
Induced drag is resistance to motion induced by the wing turning some of its _____ into _____.
A. drag, lift
B. thrust, upwash
C. lift, drag

Total Drag and Your Go Far Speed

66. [2-21/Figure 36] Label the three drag curves below:



67. [2-21/2/3]
As the airplane speeds up, induced drag _____ while parasite drag _____.
A. increases, decreases
B. decreases, increases
C. remains the same, increases

68. [2-21/2/4]
When the induced and parasite drag curves are added together, they produce the _____ curve.
A. interference drag
B. straight line
C. total drag

69. [2-21/2/4]
The lowest spot in the total drag curve is your magic number, a specific airspeed known as the
A. best power speed.
B. best L/D speed.
C. best cruise speed.

70. [2-21/2/4 & 2-21/3/1,2]
The sum of the parasite and induced drag curves reveals a point on the total drag curve (curve B above) where drag is at a minimum. The speed associated with this point is
A. the airplane's maximum power-off glide range.
B. the minimum speed to use for turbulence penetration.
C. the speed that results in maximum fuel consumption in forward flight.

71. [2-21/3/2]
The most important rule to remember in the event of a power failure after becoming airborne is to
A. immediately establish the proper gliding attitude and airspeed.
B. quickly check the fuel supply for possible fuel exhaustion.
C. determine the wind direction to plan for the forced landing.

Stretching the Glide, Saving the Hide

72. [2-22/3/2]
In a power-off glide, the best L/D speed allows the airplane to glide a _____ forward distance with a _____ amount of altitude loss.
A. minimum, maximum
B. maximum, maximum
C. maximum, minimum

Ground Effect

73. [2-23/1/4]
Ground effect allows an airplane flying close to the runway to become or remain airborne at a slightly _____ speed.
A. lower-than-normal
B. higher-than-normal
C. higher and lower

74. [2-23/3/1 & 23/3/3]
High pressure on the bottom of the wing causes air molecules to move sideways (toward the wingtip) in the direction of _____ pressure on top of the wing. This action is responsible for the creation of _____.
A. higher, wingtip vortices
B. lower, known life in the universe
C. lower, wingtip vortices

75. [2-23/3/3 & Figure 40]
Wingtip vortices rotate which way about the wingtip?
A. Outward, upward and inward.
B. Downward, outward and inward.
C. Upward, inward and outward

76. [2-23/3/3]
Wingtip vortex action increases with an increase in
A. airspeed.
B. angle of attack.
C. thrust.

77. [2-24/1/1]
The wingtip vortex not only spirals around the wingtip, it also adds a/an _____ to the air behind and along the wing's span.
A. upward flow
B. downward flow
C. acutely agonizing flow

78. [2-24/1/1]
At higher angles of attack the downward bending of the relative wind in the vicinity of the wing changes the direction of the _____ wind. This newly bent relative wind is often called the _____ relative wind.
A. relative, perpendicular
B. induced, local
C. relative, local

79. [2-24/1/1]
Recalling that effective lift always acts _____ to the relative wind, when the angle of attack increases, the total lift force tilts _____ slightly.
A. parallel, forward
B. perpendicular, rearward
C. perpendicular, forward

80. [2-24/1/2]
Floating caused by the phenomenon of ground effect will be most realized during an approach to land when at
A. less than the length of the wingspan above the surface.
B. twice the length of the wingspan above the surface.
C. a higher-than-normal angle of attack.

81. [2-24/1/3]
Ground effect results from a/an _____ in induced drag.
A. increase
B. decrease
C. tilting change

Where to Use Caution

82. [2-24/1/5]
Ground effect is most likely to result in which situation?
A. Settling to the surface abruptly during landing.
B. Becoming airborne before reaching recommended takeoff speed.
C. Inability to get airborne even though airspeed is sufficient for normal takeoff needs.

83. [2-25/1/2]
When operating in ground effect
A. wingtip vortices increase, creating wake turbulence problems for arriving and departing aircraft.
B. induced drag decreases; therefore, any excess speed at the point of flare may cause considerable floating.
C. a full stall landing will require less up elevator deflection than a full stall when done free of ground effect.

84. [2-25/1/3]
If you're approaching at a speed above the normal approach speed, make it a point to _____ before entering ground effect to prevent an excessive landing roll.
A. speed up
B. get as close to the runway as possible
C. slow down

Pitch Changes in and Out of Ground Effect

85. [2-25/See Different Designs sidebar]
What causes an airplane (except a T-tail) to pitch nose down when power is reduced and controls are not adjusted?
A. The CG shifts forward when thrust and drag are reduced.
B. The downwash on the elevators from the propeller slipstream is reduced and elevator effectiveness is reduced slipstream is reduced and elevator effectiveness is reduced.
C. When thrust is reduced to less than weight, lift is also reduced and the wings can no longer support the weight.

86. [2-25/2/1]
As the airplane becomes airborne and flies out of ground effect, the wing's downwash _____.
A. decreases
B. remains the same
C. increases

87. [2-25/2/1]
It's possible, when attempting to climb out of ground effect, to become airborne without sufficient climb speed, then attempt to climb and have the nose _____ slightly.
A. pitch down
B. pitch up
C. pitch sideways

88. [2-25/2/2]
During landing, as the airplane enters ground effect and the downwash diminishes, the nose tends to pitch _____.
A. upward
B. sideways
C. downward

89. [2-25/2/2]
Low wing airplanes experience _____ ground effect than their high wing cousins.
A. much less
B. less
C. more

Flap Over Flaps

90. [2-25/2/3]
Extending or retracting flaps changes the wing's _____ and _____ characteristics.
A. masculine, feminine
B. lift, drag
C. weight, thrust

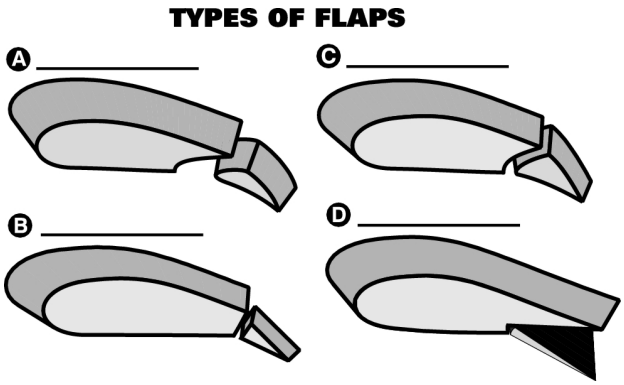
91. [2-25/2/4]
Lowering flaps lowers the trailing edge of the wing, _____ the angle the chord line makes with the relative wind. This increases the wing's lift.
A. eliminating
B. increasing
C. decreasing

92. [2-25/2/4]
When the flaps are lowered, the lowered trailing edge _____ the curvature on part of the wing, resulting in increased air velocity over the wing's upper surface.
A. eliminates
B. decreases
C. increases

93. [2-26/1/1]
Because of the larger angle of attack and greater curvature, flaps provide you with _____ lift for a given airspeed.
A. more
B. less
C. similar

Flap Varieties

94. [2-26/1/3 & 4] Name the four basic varieties of flaps:

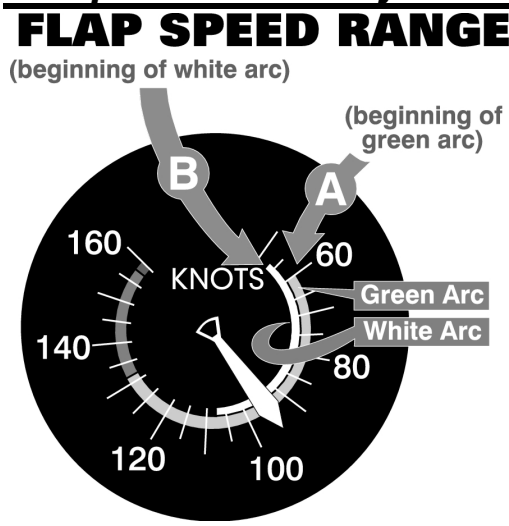


Why Use Flaps

95. [2-26/1/5]
What's the reason for putting flaps on airplanes?
A. To create the lift necessary to maintain flight at slower airspeeds.
B. To allow the airplane to fly at cruise speeds with less power.
C. To prevent excessive overspeed conditions in turbulence.

96. [2-26/2/2]
If the wind is gusty, you might use _____ flap extension than in non-gusty conditions.
A. the same
B. more
C. less

97. [2-26/2/3 & Figure 45]
The beginning of the white arc (B) as shown on the airspeed indicator at the top of the next page is known as the
A. power-off, full-flap stalling speed.
B. power-on, full-flap stalling speed.
C. power-off, no-flap stalling speed.



98. [2-26/2/3 & Figure 45]
In the airspeed indicator shown above, the airplane will fly when _____ knots of wind blow over the wings (full flaps extended) if the wings are below their critical angle of attack.
A. 46
B. 60
C. 53

99. [2-26/2/4 & Figure 45]
In the airspeed indicator shown previous page, the high speed end of the white arc is the maximum speed you may fly with flaps
A. fully extended.
B. fully retracted.
C. partially extended.

100. [2-27/1/2 & 3]
What is one purpose of wing flaps?
A. To enable the pilot to make steeper approaches to a landing without increasing the airspeed.
B. To relieve the pilot of maintaining continuous pressure on the controls.
C. To decrease wing area to vary the lift.

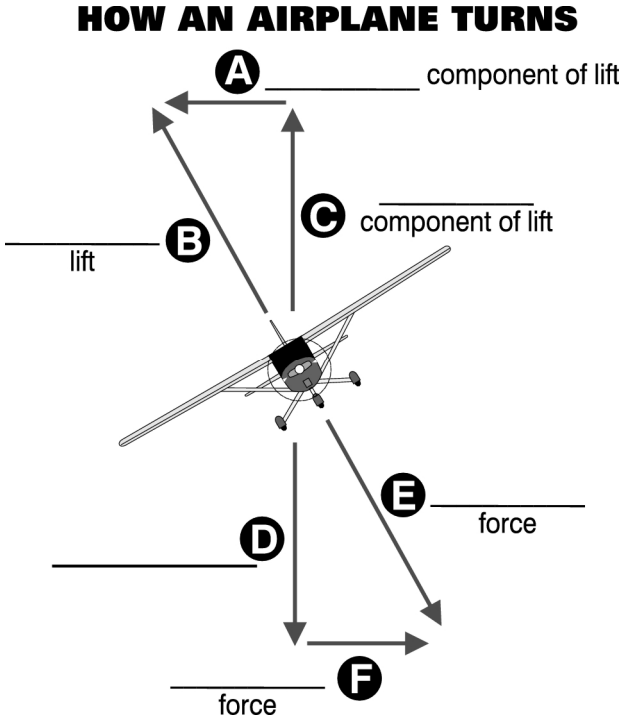
100. [2-27/1/3]
One of the main functions of flaps during approach and landing is to
A. decrease the angle of descent without increasing the airspeed.
B. permit a touchdown at a higher indicated airspeed.
C. increase the angle of descent without increasing the airspeed.

101. [2-27/3/1]
During a go-around, retract the flaps
A. immediately to their fully-retracted position.
B. in increments.
C. at your convenience when the airplane is stable.

How Airplanes Turn

102. [2-28/1/6]
What force makes an airplane turn?
A. The horizontal component of lift.
B. The vertical component of lift.
C. Centrifugal force.

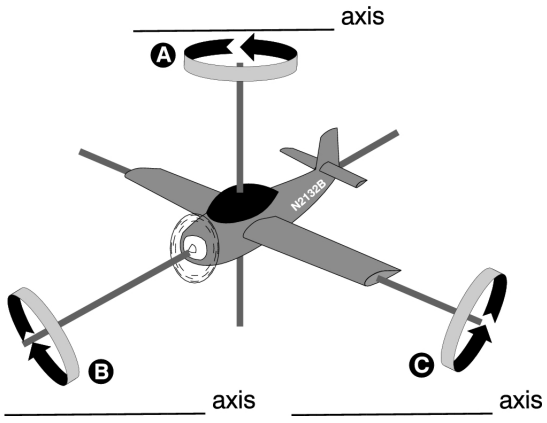
103. [2-28/Figure 46] Write in the names of the force vectors an airplane experiences in a turn:



104. [2-28/1/7]
Tilting the total lift force while in a turn means _____ lift is available to act vertically against the airplane's weight.
A. more
B. less
C. horizontal

105. [2-28/Figure 47] Label the axes below:

THE THREE AXES OF AN AIRPLANE



Flight Controls

106. [2-29/1/2]
Which axis runs through the centerline of the airplane from nose to tail?
A. Lateral axis.
B. Vertical axis.
C. Longitudinal axis.

107. [2-29/1/2]
Airplanes roll about what axis?
A. The lateral axis.
B. The vertical axis.
C. The longitudinal axis.

108. [2-29/1/3]
Which axis runs from wing tip to wing tip, sideways through the airplane?
A. The lateral axis.
B. The vertical axis.
C. The longitudinal axis.

109. [2-29/1/3]
Airplanes _____ about their lateral axis.
A. roll
B. pitch
C. yaw

Ailerons

110. [2-29/1/5]
The purpose of ailerons is to _____ the airplane in the direction you desire to turn.
A. yaw
B. bank
C. pitch

111. [2-29/1/5]
Ailerons function to allow the right and left wings to develop _____ lift.
A. the same amount of
B. different amounts of
C. negative degrees of

112. [2-29/Figure 49]
When the control wheel (or stick) is turned to the right or left, the ailerons simultaneously move in _____.
A. the same direction
B. different directions
C. variable directions (depends on other factors)

Adverse Yaw

113. [2-30/2/2]
Adverse yaw is
A. a desirable characteristic used in the design of wings.
B. an undesirable byproduct of turning.
C. an artifact of wing design that plays no role in normal flight.

Rudders

114. [2-30/3/1]
What is the purpose of the rudder on an airplane?
A. To control yaw.
B. To control overbanking tendency.
C. To control roll.

115. [2-31/Figure 55]
Which of the illustrations above depicts the excessive use of right rudder during the entry of a right turn?
A. Instrument B.
B. Instrument A.
C. Instrument C.

116. [2-32/1/4]
Not using the rudder during a turn will result in _____ turn.
A. a complex
B. a coordinated
C. an uncoordinated

117. [2-32/1/5]
As the airplane slows down and enters a stall, which of the
following three control surfaces is the last to lose control authority?
A. Aileron.
B. Elevator.
C. Rudder.

Elevator

118. [2-33/1/1&2]
Applying forward pressure on the control wheel (or stick) deflects the elevator _____ causing the tail to _____.
A. downward, rise
B. upward, lower
C. in the opposite direction, yaw

Trim Tabs

119. [2-33/1/3]
The purpose of the trim tab is to _____ control pressure required of the pilot.
A. eliminate
B. increase
C. change the direction of the

120. [2-33/2/1]
Which direction does the trim tab move relative to the primary control surface it affects?
A. The same direction.
B. Rearward.
C. Opposite.

Left Turning Tendencies (not political)

121. [2-34/1/3]
In what flight condition is torque effect the greatest in a single-engine airplane?
A. Low airspeed, high power.
B. Low airspeed, low power.
C. High airspeed, high power.

122. [2-35/1/3]
The left turning tendency of an airplane caused by P-factor is the result of the
A. clockwise rotation of the engine and the propeller turning the airplane counter-clockwise.
B. propeller blade descending on the right producing more thrust than the ascending blade on the left.
C. gyroscopic forces applied to the rotating propeller blades acting 90 degrees in advance of the point to which the force was applied.

123. [2-35/1/3]
P-factor is more likely to cause the airplane to yaw to the left
A. at low angles of attack.
B. at high angles of attack.
C. at high airspeeds.

Postflight Briefing 2-1: How a Spin Occurs

124. [2-20 & 37/See How a Spin Occurs]
In what flight condition must an aircraft be placed in order to spin?
A. Partially stalled with one wing low.
B. In a steep diving spiral.
C. Stalled.

125. [2-20 & 37]See How a Spin Occurs]
During a spin to the left, which wing(s) is/are stalled?
A. Both wings are stalled.
B. Neither wing is stalled.
C. Only the left wing is stalled.

126. [2-37/2/2]
A typical situation that often results in a spin occurs when
A. the pilot over-aggressively leans the airplane's engine.
B. a pilot overshoots the turn to the final approach and applies rudder to align the nose with the runway while holding the bank angle constant with aileron.
C. the pilot applies full flaps at too high an airspeed.

127. [2-38/1/3]
Parasite drag is caused by
A. the effect of decreasing temperatures, but increasing relative humidity on the airplane's surfaces.
B. the pilot's failure to perform an adequate preflight inspection.
C. friction of protruding airplane parts with the air.

128. [2-38/1/4]
Generally speaking, parasite drag
A. is a result of the design of an airplane and there is little the pilot can do to reduce it.
B. is a result of careless maintenance.
C. has little real-world effect on general aviation pilots.

129. [2-38/3/2]
As an airplane's airspeed doubles, parasite drag
A. remains constant.
B. is significantly reduced.
C. quadruples.

130. [2-39/3/2]
Induced drag is
A. the rearward pull of the total lifting force.
B. the drag caused by necessary items such as struts, antennas, etc.
C. always a result of poor piloting technique.

131. [2-40/Figures 67 & 68]
At small angles of attack
A. induced drag is at its greatest.
B. induced drag is at its lowest.
C. induced drag is always greater than parasite drag.

Postflight Briefing 2-3: Maximum Endurance & Range

132. [2-41/1/1]
If you are trying to reach a destination on limited fuel
A. fly at maximum cruise speed in order to arrive before you run out of fuel.
B. fly at 65% power, leaning the fuel mixture in strict accordance with the POH or owner's manual.
C. fly at the airplane's maximum range speed.

133. [2-41/1/3]
A good reason to use maximum endurance speed is
A. to minimize fuel consumption, e.g., while waiting for the weather to clear.
B. to minimize the time to get to your destination.
C. to go the greatest distance possible on your available fuel.

134. [2-41/2/2,3]
The maximum endurance speed is always _____ the maximum range speed.
A. greater than
B. within 1% or 2% of
C. less than

135. [2-42/1/2 & Figure 72]
In the "region of reversed command," slower level flight requires
A. less power.
B. more power.
C. It depends on the airplane and engine.

Postflight Briefing 2-4: Weight, Glide $ the Ride

136. [2-43/1/1]
To maintain an airplane's best L/D (lift over drag ratio), a decrease in weight requires
A. an increase in airspeed.
B. a decrease in airspeed.
C. a continuous airspeed.

137. [2-43/2/3]
You can determine an airplane's best glide speed
A. by experimentation in the region of reversed command.
B. by reference to the airspeed indicator.
C. by referring to the POH or the owner's manual.

Postflight Briefing 2-5: A Different Look at Maneuvering Speed

138. [2-44/1/1]
To prevent structural damage to the airplane during turbulence,

A. maintain flight at or below the airplane's design maneuvering speed.
B. carry no more than 50% of maximum capacity of fuel.
C. use at least 10 degrees of flaps.

139. [2-44/1/2]
Which V-speed represents maneuvering speed?
A. Va
B. Vlo
C. Vne

141. [2-44/1/4]
With respect to the certification of aircraft, which are categories of aircraft?
A. Normal, utility, acrobatic.
B. Airplane, rotorcraft, glider.
C. Landplane, seaplane.

142. [2-44 & 45/1/3]
The amount of excess load that can be imposed on the wing of an airplane depends upon the
A. position of the CG.
B. speed of the airplane.
C. engine power.

143. [2-45/1/4]
When the airplane's weight decreases, the maneuvering speed _____.
A. remains the same
B. increases
C. decreases

144. [2-44, Postflight Briefing #2-5]
What is an important airspeed limitation that is not color coded on airspeed indicators?
A. Never-exceed speed.
B. Maximum structural cruising speed.
C. Maneuvering speed.

145. [2-44, Postflight Briefing #2-5]
Upon encountering severe turbulence, which flight condition should the pilot attempt to maintain?
A. Constant altitude and airspeed.
B. Constant angle of attack.
C. Level flight attitude.

Postflight Briefing 206: Frost

146. [2-46/See Frost insert]
How will frost on the wings of an airplane affect takeoff performance?
A. Frost will disrupt the smooth flow of air over the wing, adversely affecting its lifting capability.
B. Frost will change the camber of the wing, increasing its lifting capability.
C. Frost will cause the airplane to become airborne with a higher angle of attack, decreasing the stall speed.

147. [2-46/See Frost insert]
Why is frost considered hazardous to flight?
A. Frost changes the basic aerodynamic shape of the airfoils, thereby decreasing lift.
B. Frost slows the airflow over the airfoils, thereby increasing control effectiveness.
C. Frost spoils the smooth flow of air over the wings, thereby decreasing lifting capability.

148. [2-46/See Frost insert]
How does frost affect the lifting surfaces of an airplane on takeoff?
A. Frost may prevent the airplane from becoming airborne at normal takeoff speed.
B. Frost will change the camber of the wing, increasing lift during takeoff.
C. Frost may cause the airplane to become airborne with a lower angle of attack at a lower indicated airspeed.

149. [2-46/See Frost insert]
Frost on the airfoil _____ the airplane's stalling speed.
A. increases
B. decreases
C. has no effect on

150. [Bonus question]
(Refer to figure 68.) The positive limit load factor is represented by the
A) vertical dashed line from E to F.
B) vertical solid line from D to G.
C) horizontal dashed line from C to point E.

1. A
2. A/Thrust
   B/Weight
   C/Drag
   D/Lift
3. A
4. A
5. B
6. C
7. A/90
   B/weight
   C/90
   D/weight,
   E/drag
   F/thrust
8. B
9. B
10. A/90
    B/weight
    C/90
    D/weight,
    E/thrust, weight
    F/Drag
11. A/leading
    B/trailing
    C/cambered,
    D/cambered
    E/Chord
12. B
13. A
14. C
15. B
16. A
17. C
18. C
19. A
20. A
21. A/attack
    B/motion
    C/relative
22. A
23. B
24. C
25. A
26. decrease
27. B
28. C
29. A
30. C
31. A
32. C
33. A
34. C
35. A
36. A
37. A
38. C
39. B
40. B
41. A
42. C
43. A
44. C
45. A
46. A
47. B
48. C
49. angle
50. B
51. C
52. C
53. B
54. C
55. A
56. B
57. C
58. B
59. A
60. C
61. B
62. A
63. A
64. C
65. C
66. A/induced
    B/total
    C/parasite
67. B
68. C
69. B
70. A
71. A
72. C
73. A
74. C
75. A
76. B
77. B
78. C
79. B
80. A
81. B
82. B
83. B
84. C
85. B

86. C
87. B
88. C
89. C
90. B
91. B
92. C
93. A
94. A/fowler
B/plain
C/slotted
D/split
95. A
96. C
97. A
98. C
99. A
100. A
101. C
102. B
103. A
104. A/horizontal
B/total
C/vertical,
D/weight
E/resultant
F/centrifugal
105. B
106. A/vertical
B/longitudinal,
C/lateral
107. C
108. C
109. A
110. B
111. B
112. B
113. B
114. B
115. A
116. C
117. C
118. C
119. A
120. A
121. C
122. A
123. B
124. B
125. C
126. A
127. B
128. C
129. A
130. C
131. A
132. B
133. C
134. A
135. C
136. B
137. B
138. C
139. A
140. A
141. A
142. B
143. C
144. C
145. C
146. A
147. C
148. A
149. A
150. ?