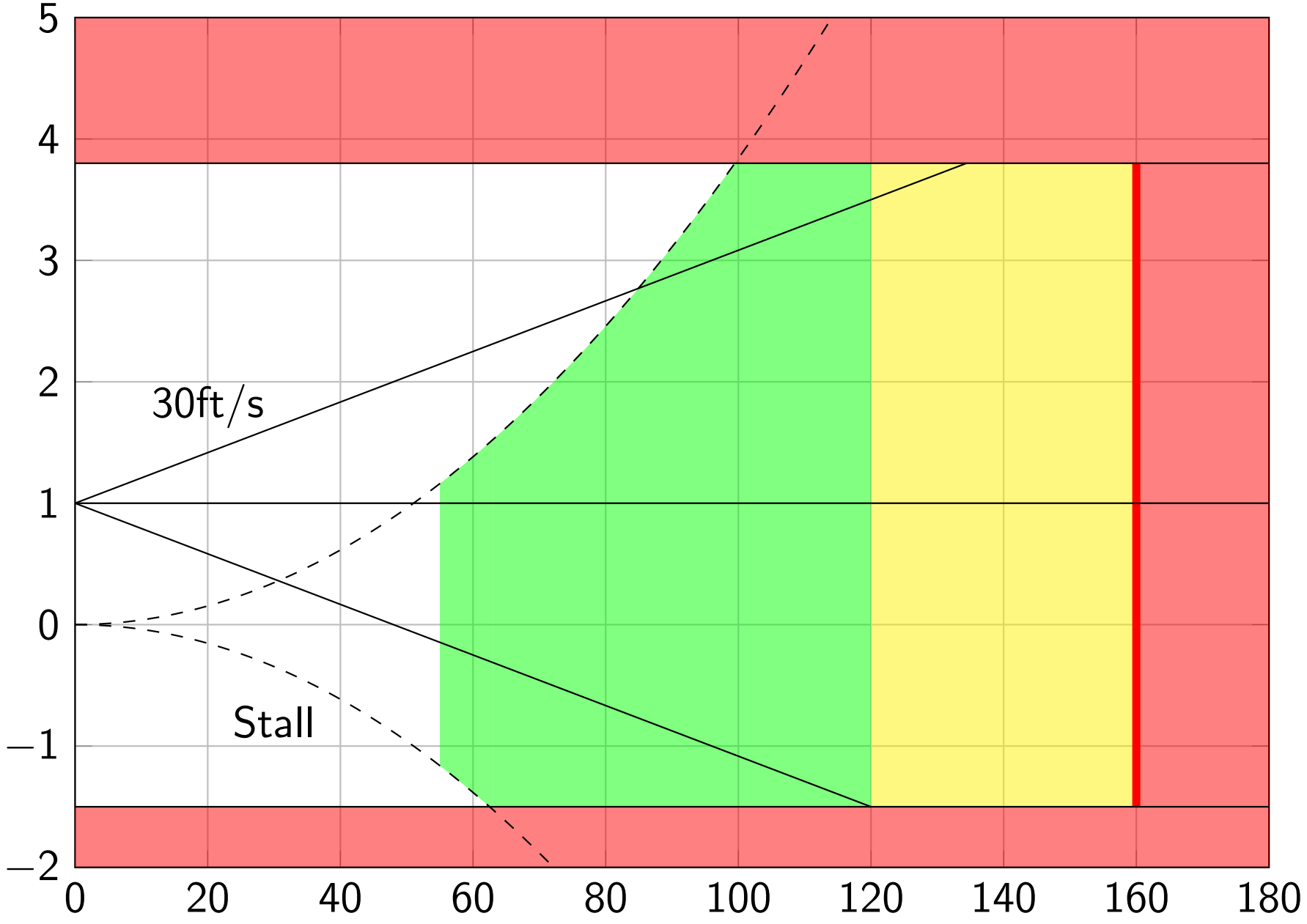
Performance

Chapter 8

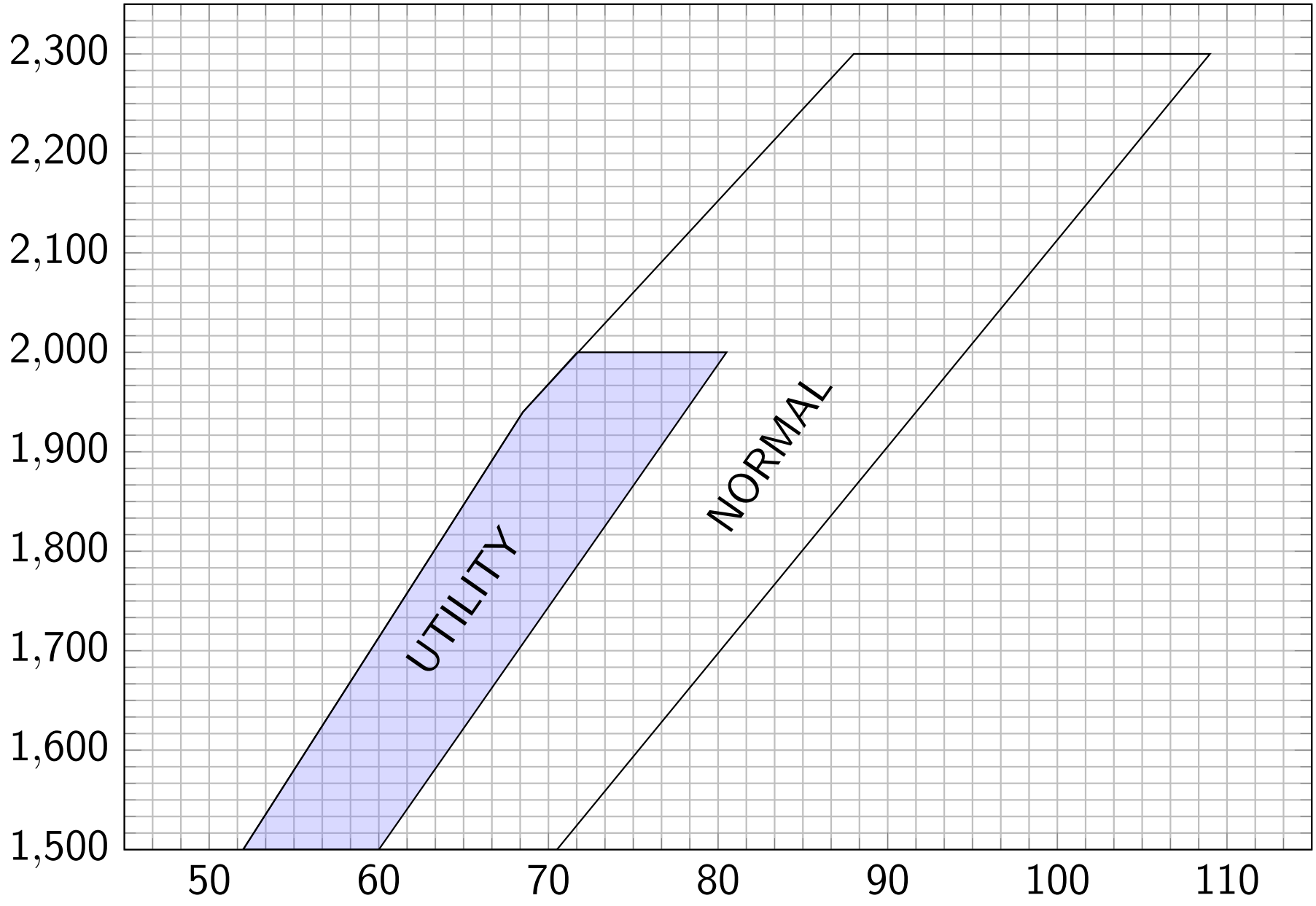
Questions

1. Are you within the center of gravity moment envelope for the plane (see Figure 8-7).
2. What is the pressure and density altitudes?
3. Which runway will you use? What are the headwinds and crosswinds?
4. What is your total landing distance (see Figure 8-20)?
5. What is your total take-off distance (see Figure 8-12)?
6. How much fuel will you have upon reaching your cruse altitude of $7,500$ feet?

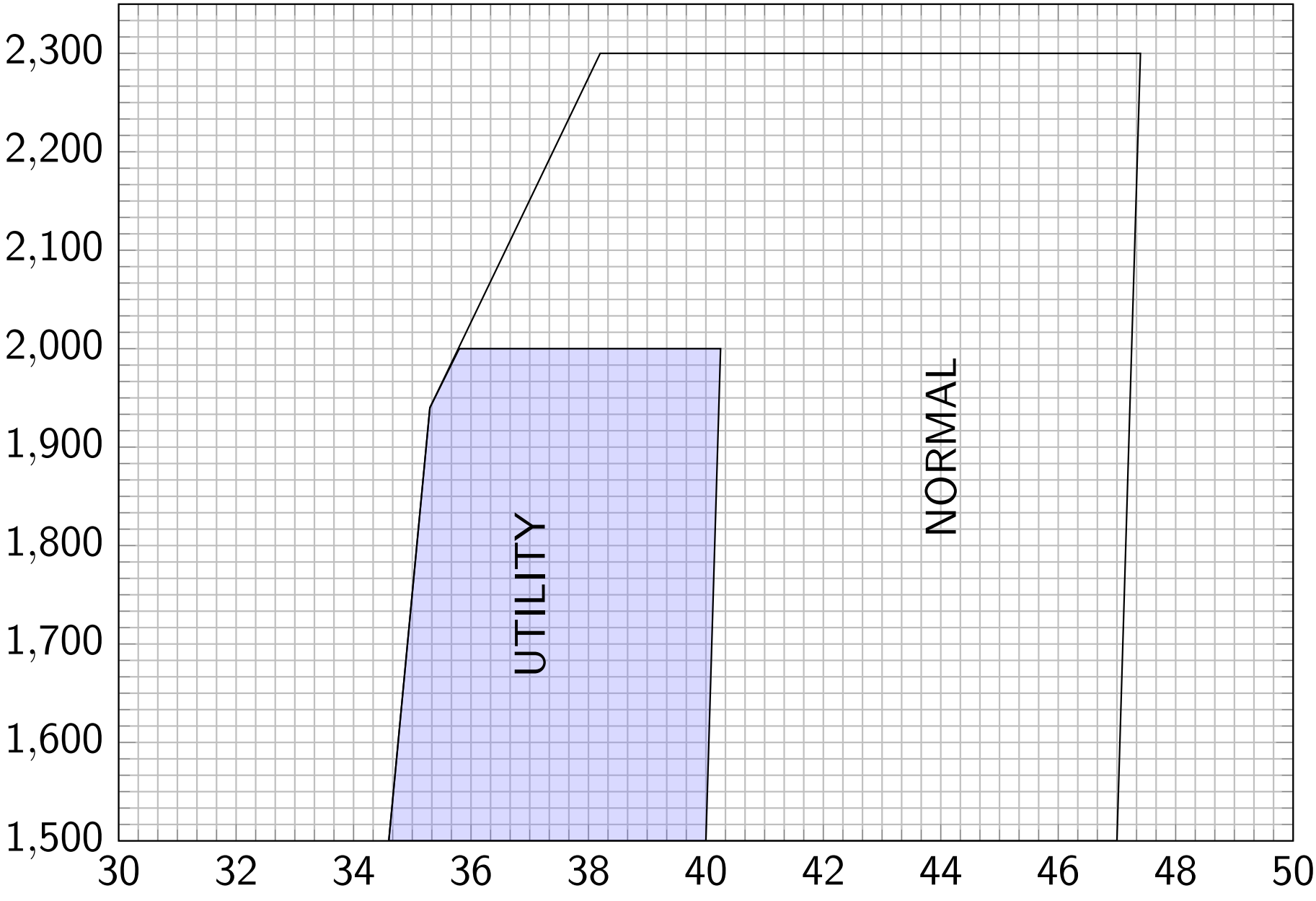
Maneuvering Envelope



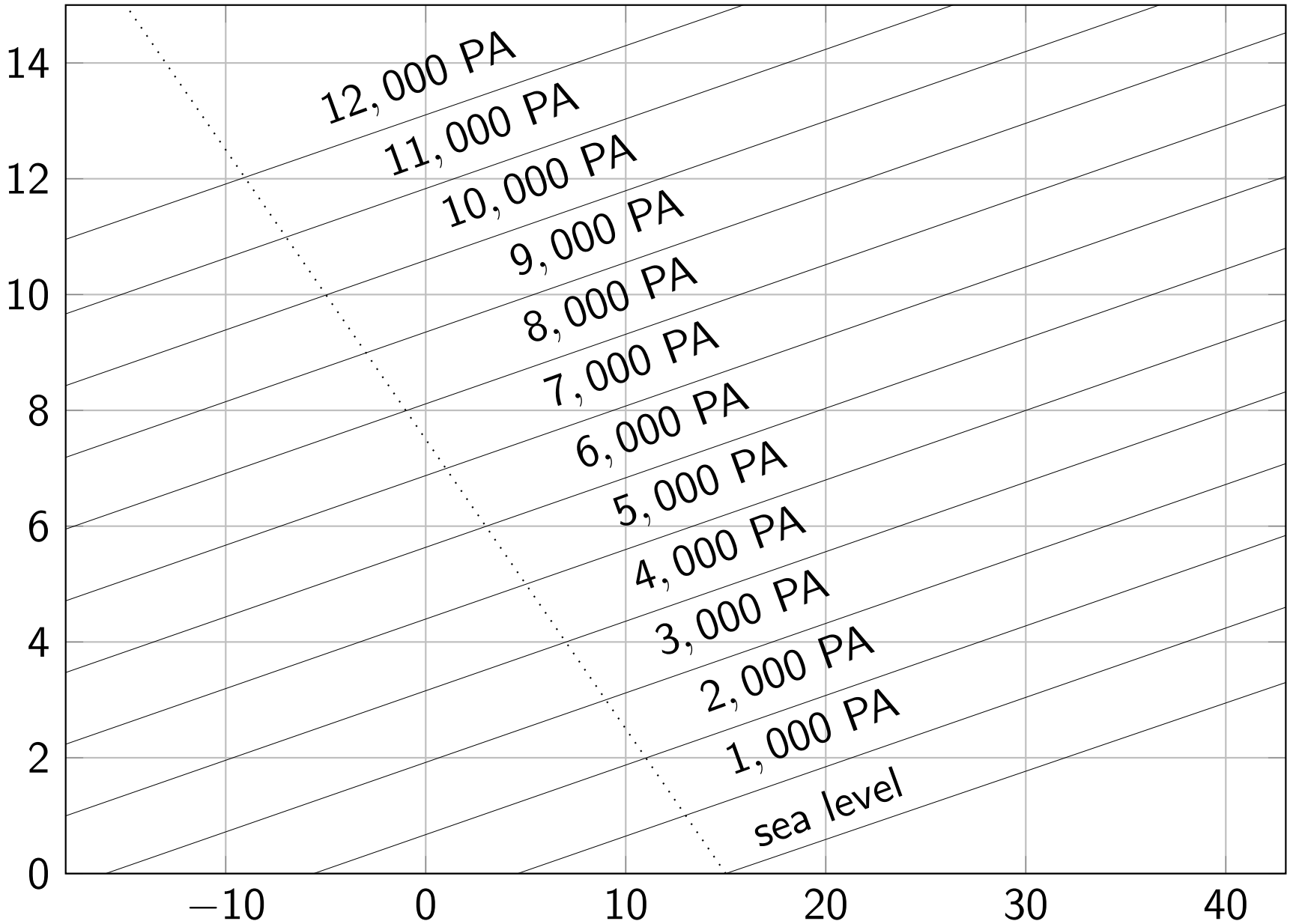
Moment Envelope



CG Envelope


2,300
2,200
2,100
2,000
1,900
1,800
1,700
1,600
1,500
30
32
34
36
38
40
42
44
46
48
50
UTILITY
NORMAL

Density Altitude



1) Determine the moment with the following data:

	lbs	$\frac{\text{moment}}{1000}$
Empty weight	1,350	51.5
Pilot and front passenger	340	
Fuel (std. tanks)	Capacity	
Oil, 8 qts.	15	−0.2

A 69.9 lbs-in.

B 74.9 lbs-in.

C 77.0 lbs-in.

2) What is the maximum amount of fuel that may be aboard the airplane on takeoff if it is loaded as follows

	lbs	$\frac{\text{moment}}{1000}$
Empty weight	1,350	51.5
Pilot and front passenger	340	
Rear passengers	310	
Baggage	45	
Oil, 8 qts.	15	−0.2

A 24 gal.

B 34 gal.

C 40 gal.

3) What ist he maximum amount of baggage that may be loaded aboard the airplane for the CG to remain within the loading envelope?

	lbs	$\frac{\text{moment}}{1000}$
Empty weight	1,350	51.5
Pilot and front passenger	250	
Rear passengers	400	
Baggage		
Fuel 30 gal.		
Oil, 8 qts.	15	−0.2

A 120 lbs.

B 105 lbs.

C 90 lbs.

4) Calculate the moment of the airplane and determine which category is applicable.

	lbs	$\frac{\text{moment}}{1000}$
Empty weight	1,350	51.5
Pilot and front passenger	310	
Rear passengers	96	
Fuel 38 gal.		
Oil, 8 qts.		−0.2

A 79.2, utility category.

B 80.8, utility category.

C 81.2, normal category.

5) Determine if the airplane's weight and balance are within limits.

Front seat occupants	340 lbs.
Rear seat occupants	294 lbs.
Fuel	44 gals.
Baggage	56 lbs.

A It is with limits.

B It is 20 lbs overweight, the CG is within limits.

C Weight is within limits, but CG is out of limits forward.

6) Which action can adjust the airplane's weight to maximum gross weight and the CG within limits for takeoffs?

Front seat occupants	425 lbs.
Rear seat occupants	300 lbs.
Fuel	44 gals.

A Drain 12 gallons of fuel.

B Drain 9 gallons of fuel.

C Transfer 12 gallons of fuel from the main tanks to the auxiliary tanks.

7) What effect does a 35-gallon fuel burn have on the weight and balance if the airplane weighed $2,890$ points and the moment/1000 was $2,452$ at takeoff?

A Weight is reduced by 210 lbs and the CG is unaffected.

B Weight is reduced to 2680 lbs and the CG moved forward.

C Weight is reduced by 210 lbs and the CG is aft of limits.

8) After takeoff, which airspeed would permit the pilot to gain the most altitude in a given period of time?

A Cruising climb speed.

B Best rate-of-climb speed.

C Best angle-of-climb speed.

9) Which combination of atmospheric conditions will reduce aircraft takeoff and climb performance?

A Low temperature, low relative humidity, and low density altitude.

B High temperature, low relative humidity, and low density altitude.

C High temperature, high relative humidity, and high density altitude.

10) How can pressure altitude be determined?

A Set the field elevation in the altimeter setting window and read the indicated altitude.

B Set the altimeter to zero and read the value in the altimeter setting window.

C Set 29.92 in the altimeter setting window and read the indicated altitude.

11) What fuel flow should a pilot expect at $11,000$ feet on a standard day with 65% maximum continuous power?

A 10.6 gallons per hour.

B 11.2 gallons per hour.

C 11.8 gallons per hour.

12) What effect does higher density altitude have on propeller efficiency?

A Increased efficiency due to less friction on the propeller blades.

B Reduce efficiency because the propeller exerts less force than at lower density altitudes.

C Increased efficiency because the propeller exerts less force on the thinner air.

13) An airplane is usually affected by ground effect at what height above the surface?

A Between 100 and 200 feet above the surface in calm wind conditions.

B Less than half of the airplane's wingspan above the surface.

C Twice the length of the airplane's wingspan above the surface.

14) Which adverse affect must a pilot be aware of as a result of the phenomenon of ground effect during takeoff?

A Difficulty in getting airborne even thought airspeed is sufficient for normal takeoff.

B Becoming airborne before reaching recommended takeoff speed.

C Settling back to the surface immediately after becoming airborne.

15) If you plane to land at an airport where the elevation is $7,500$ feet, the indicated approach airspeed should be

A the same as that used at a sea level airport.

B lower then that used at a sea level airport.

C higher than that used at a sea level airport.

16) As altitude increases, the indicated airspeed at which a given airplane stalls in a particular configuration will

A decrease as the true airspeed decreases.

B decrease as the true airspeed increases.

C remain the same as at low altitude.

17) Of what practical value is pressure altitude?

A To use on all aircraft performance charts since the charts are based on pressure altitude.

B To use for obstacle clearance at higher altitudes where accurate altimeter settings are not available.

C To use for computer solutions to determine density altitude, true altitude, true airspeed, etc.

18) Determine the approximate ground roll distance for takeoff under the following conditions:

OAT	95°F
Pressure altitude	2,000 feet
Takeoff weight	3,500 lbs
Wind (headwind)	20 knots

A 650 feet.

B 800 feet.

C 1,00 feet.

19) What affect, if any, does high humidity have on aircraft performance?

A It increases performance.

B It decreases performance.

C It has no effect on performance.