



NATIONAL ASSOCIATION OF FLIGHT INSTRUCTORS

MENTOR

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If a Performance Chart Could Speak: Learning Your Airplane



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Catherine Cavagnaro

Flying Smart Column, AOPA Pilot Magazine

Aerobatic CFI, Ace Aerobatic School

Designated Examiner, Nashville FSDO

Professor of Mathematics, Sewanee: The

University of the South

2020 FAA CFI of the Year

2018 FAA Safety Representative of the Year

Member, Tennessee Aviation Hall of Fame



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If a Performance Chart Could Speak: Learning Your Airplane

- * Weight and Balance**
- * Takeoff Performance**



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P&E | PROFICIENCY

Weight and Balance

New airplane, new W&B

Check that center of gravity

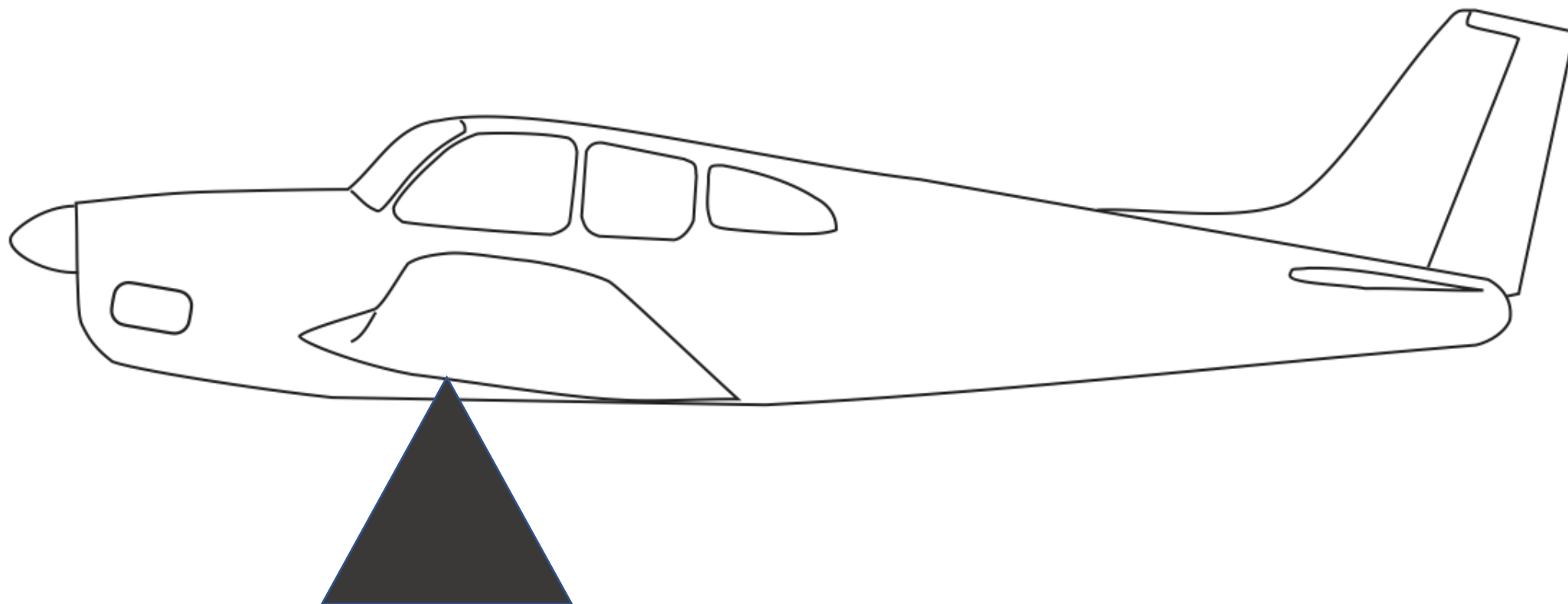
BY CATHERINE CAVAGNARO

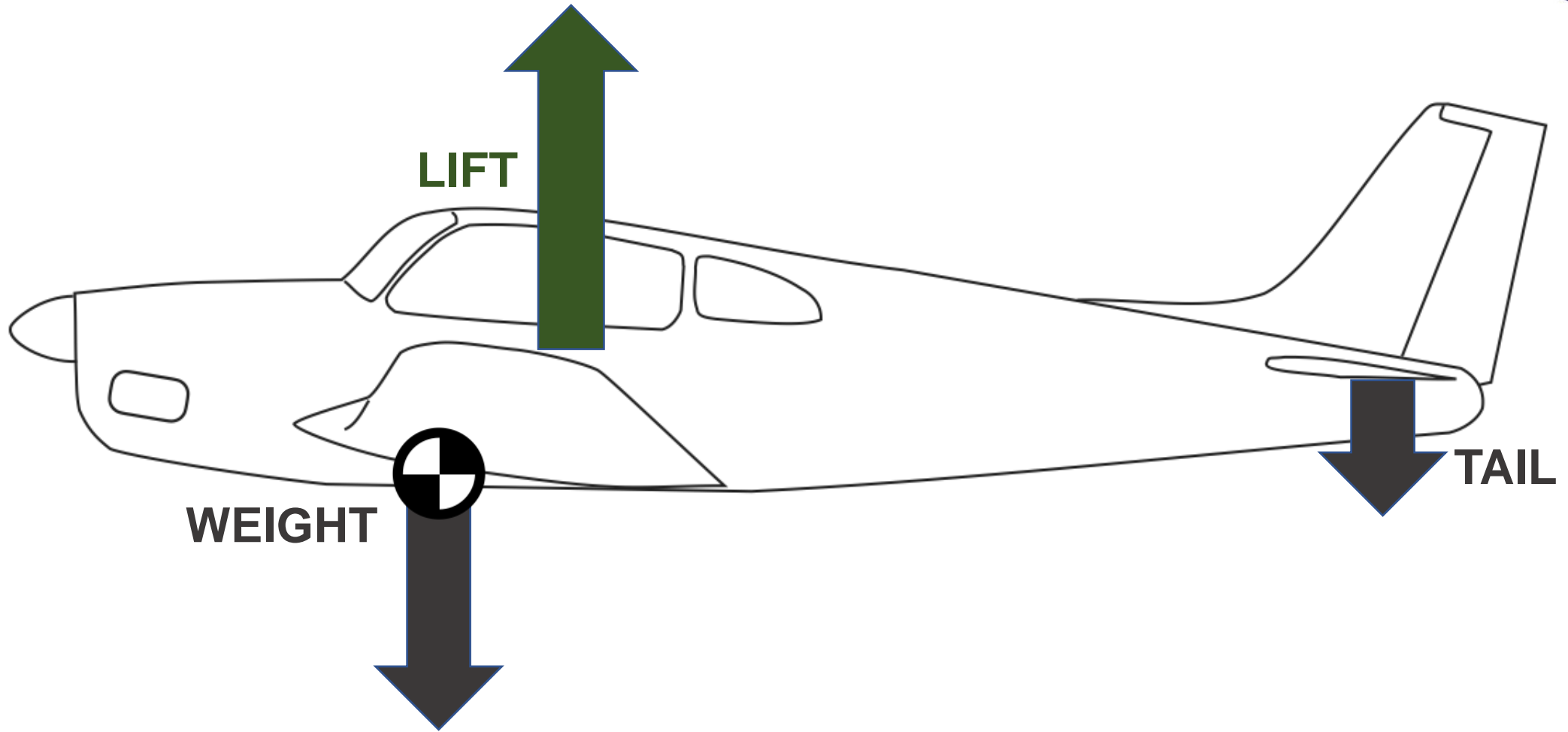


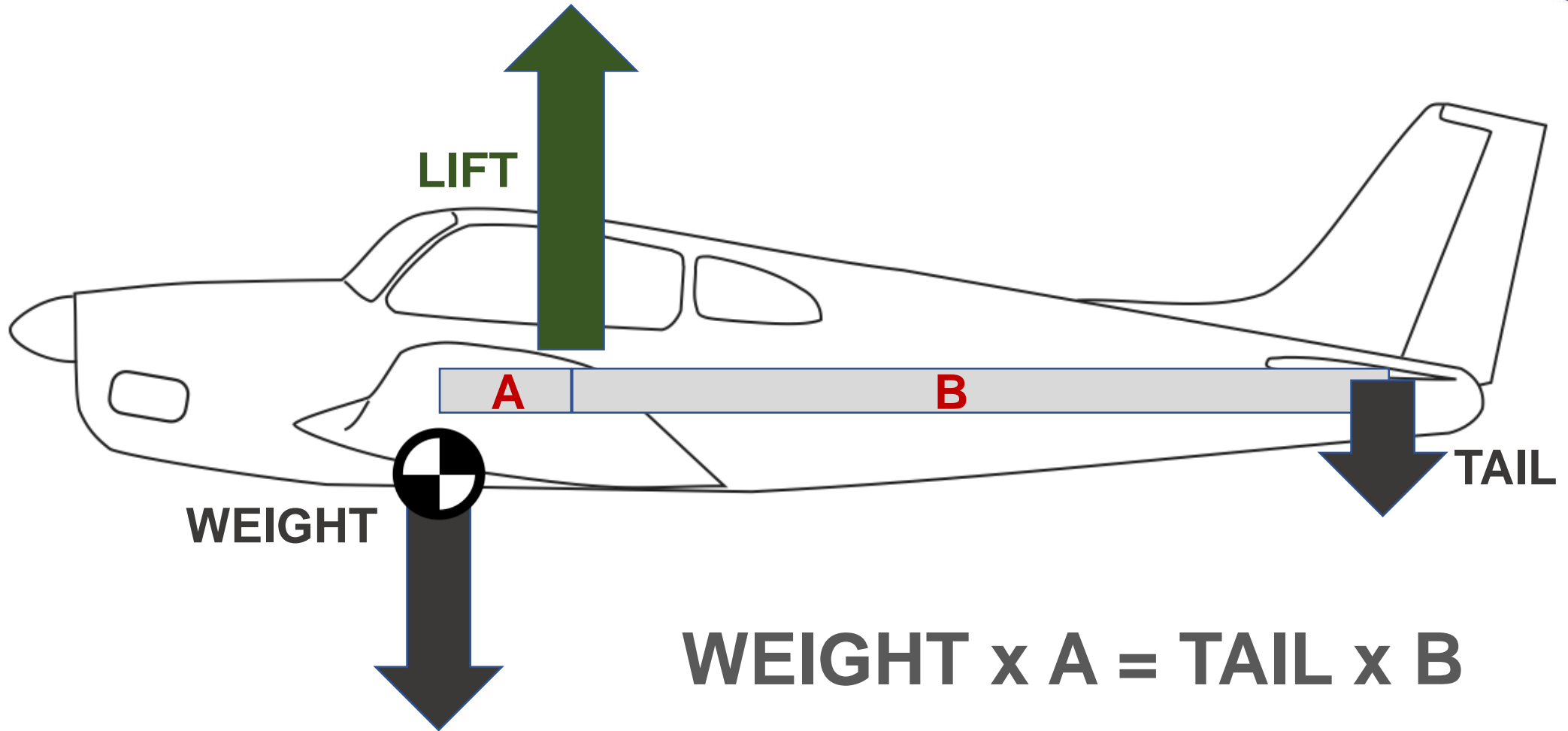
THE AEROBATIC Beechcraft Bonanza *Niky* was a perfect fit for Catherine Cavagnaro and her family—once Cavagnaro made an avionics upgrade that changed the weight and balance and made more of the useful load available.

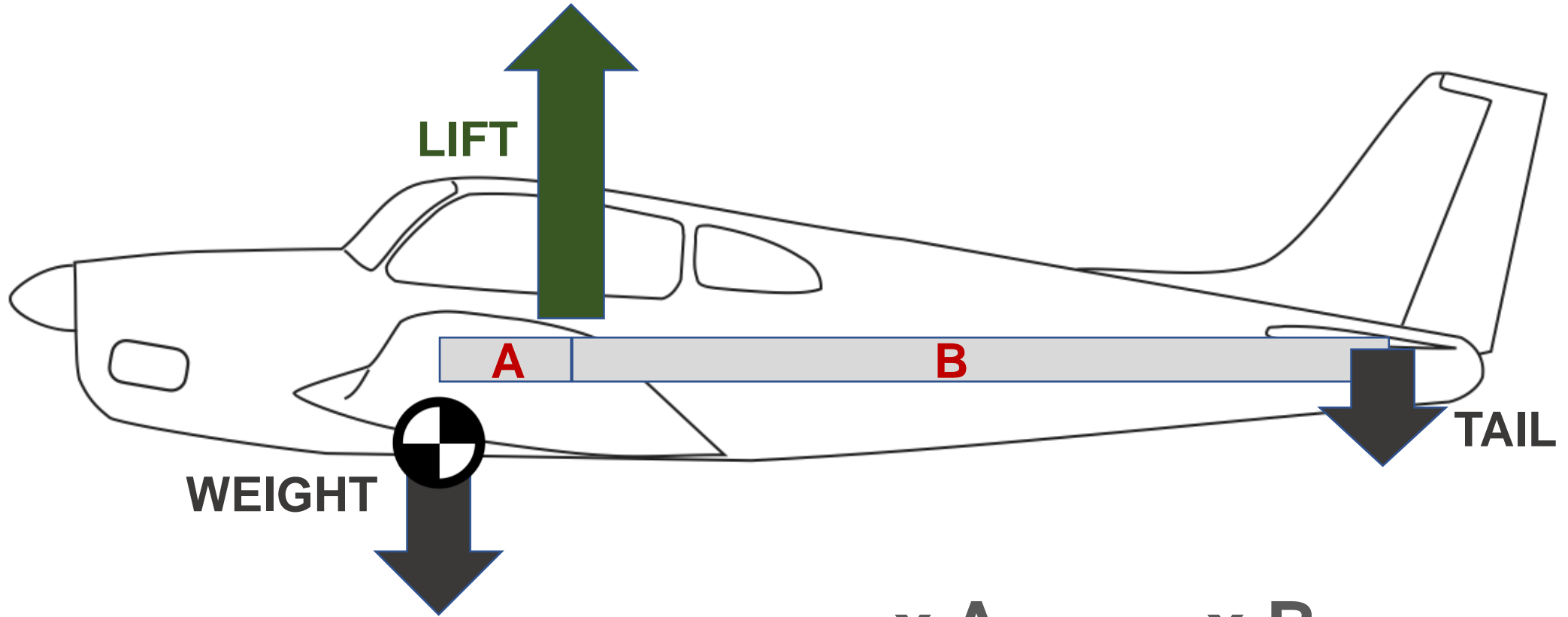
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AOPA PILOT MAGAZINE
AUGUST 2020

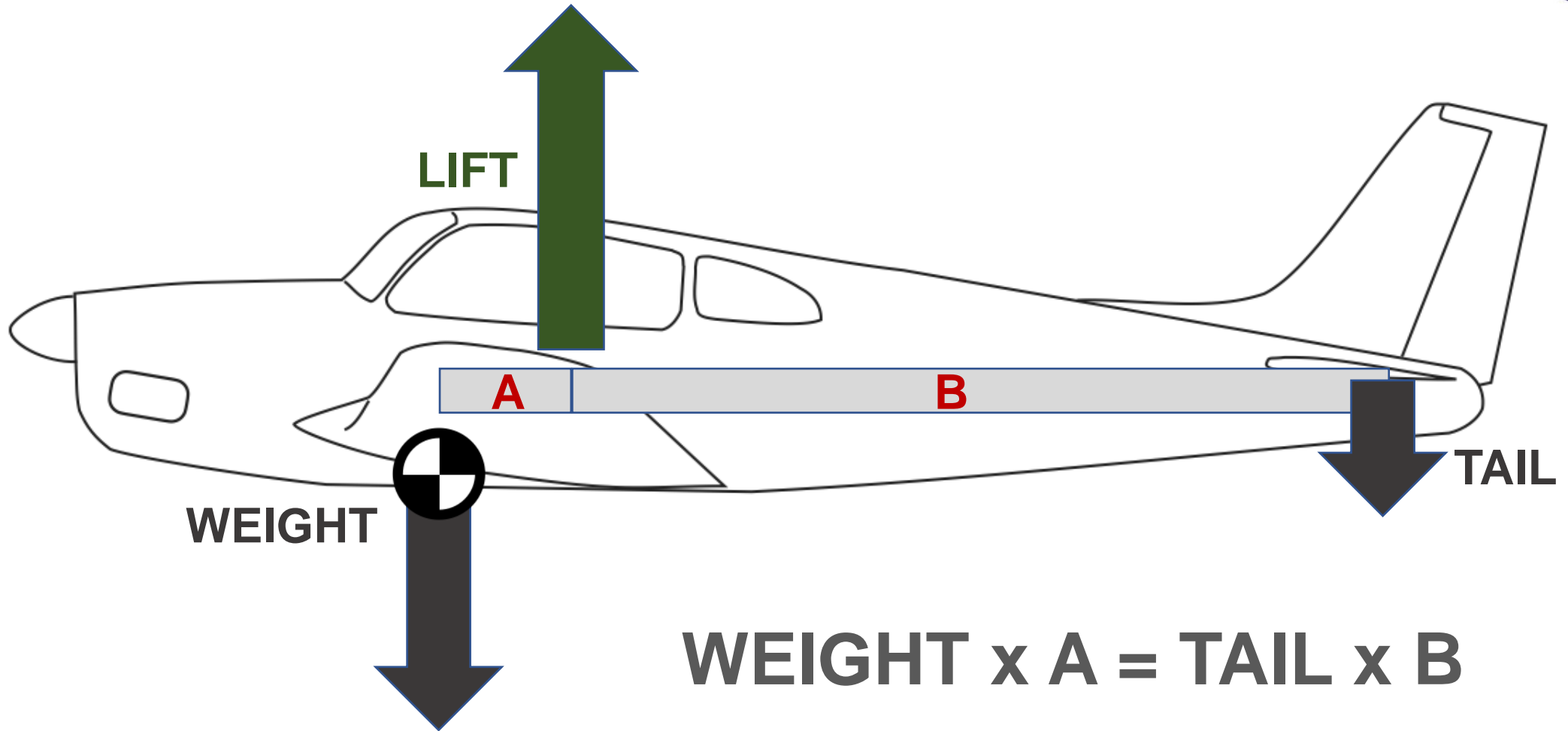


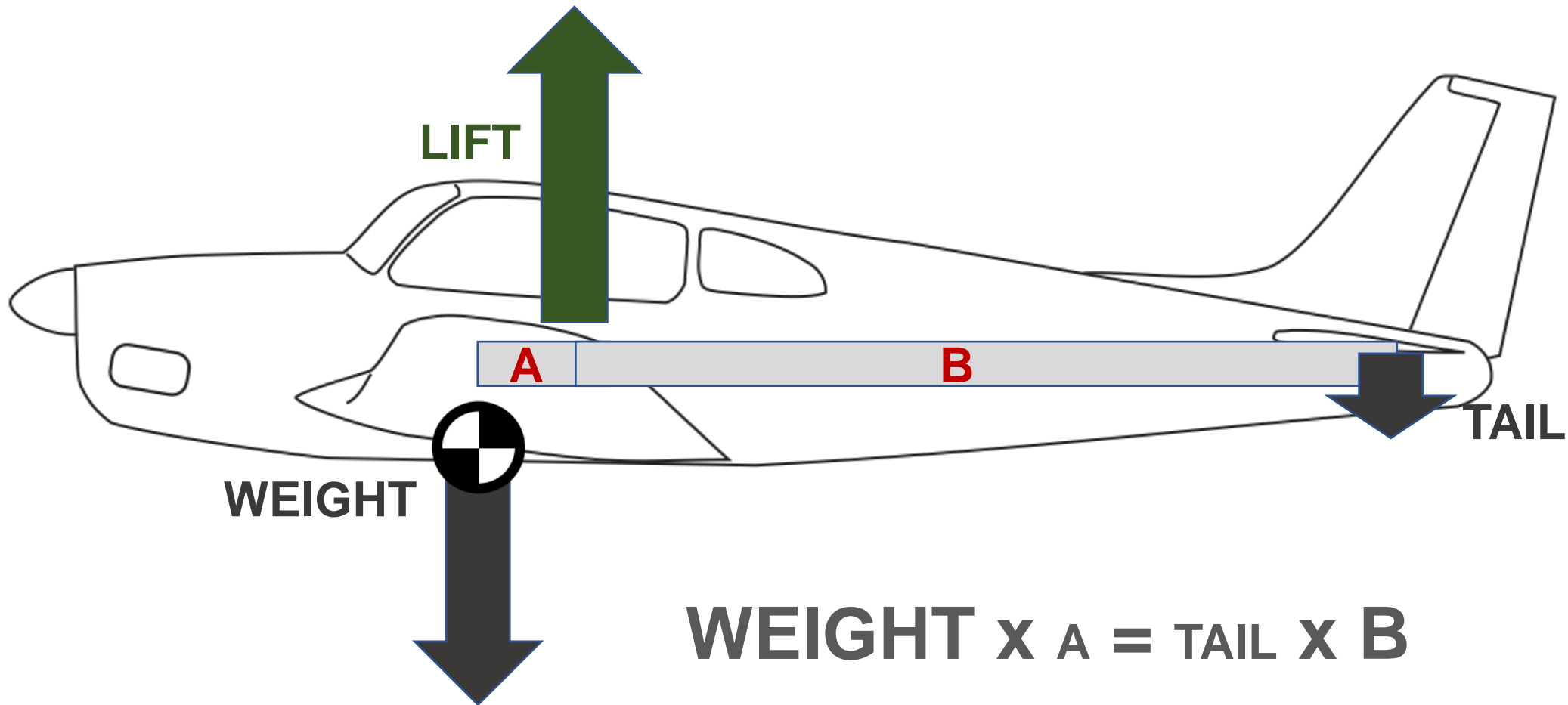


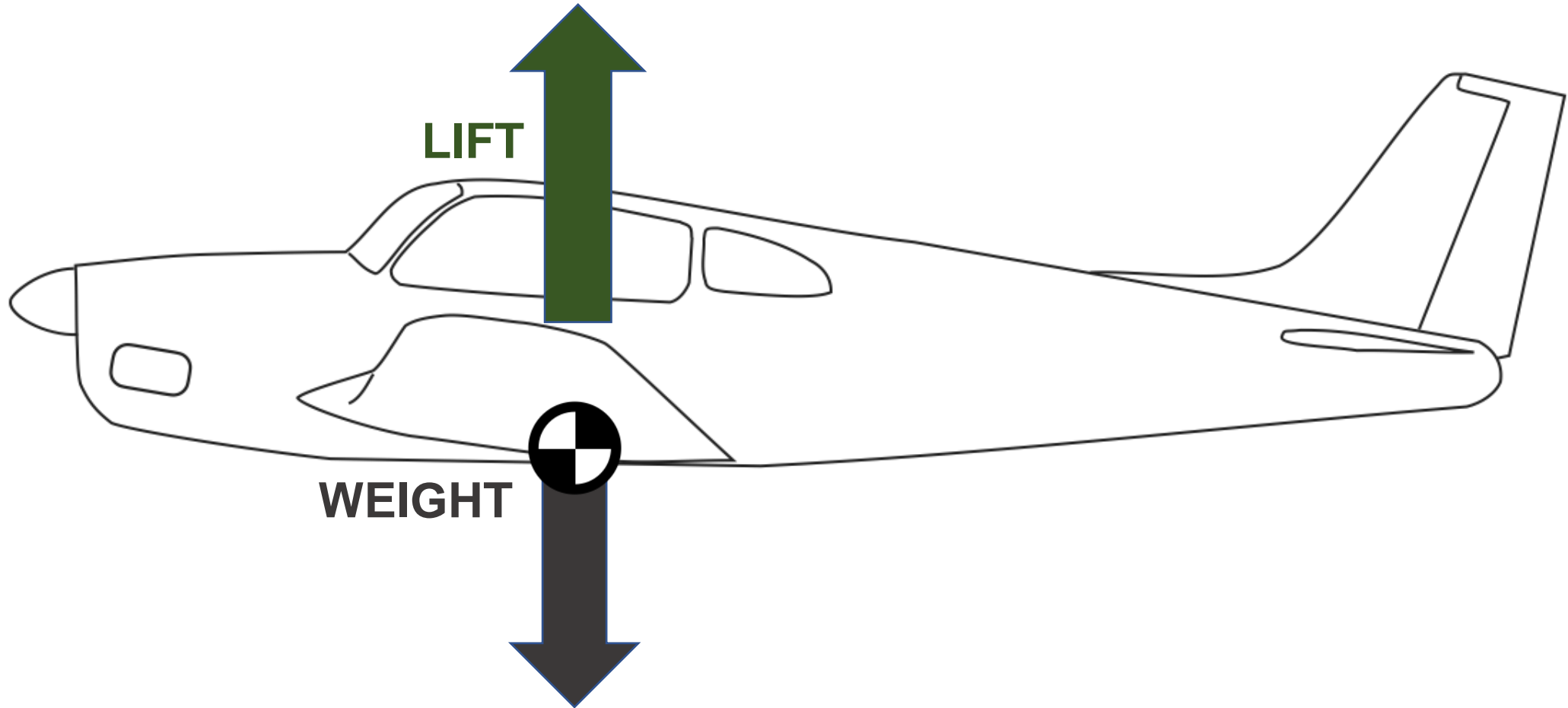


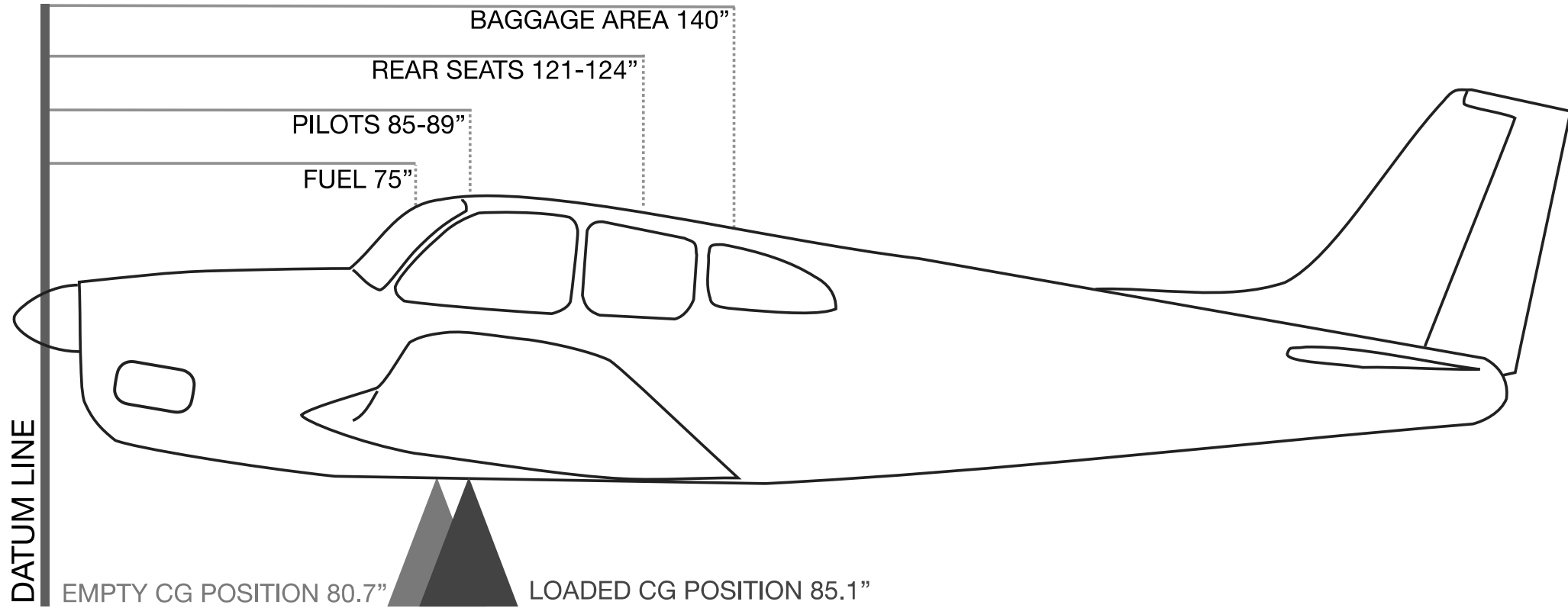


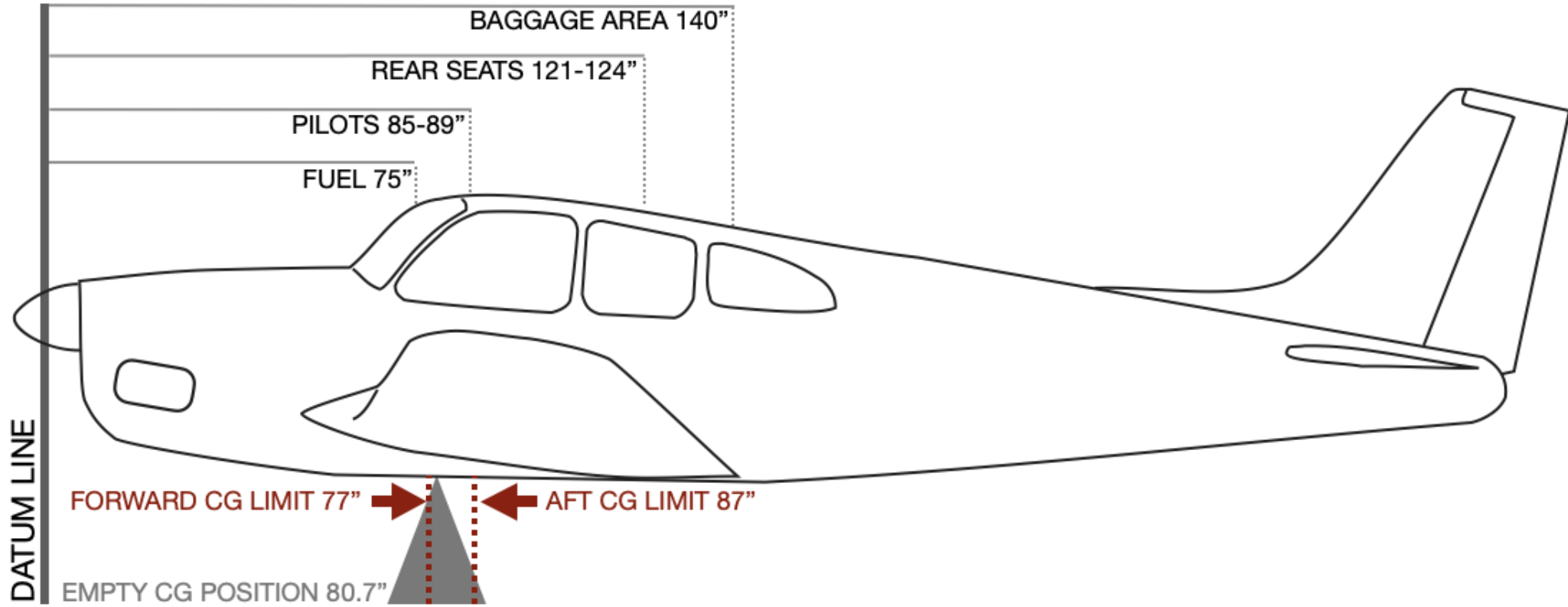
$$\text{WEIGHT} \times A = \text{TAIL} \times B$$

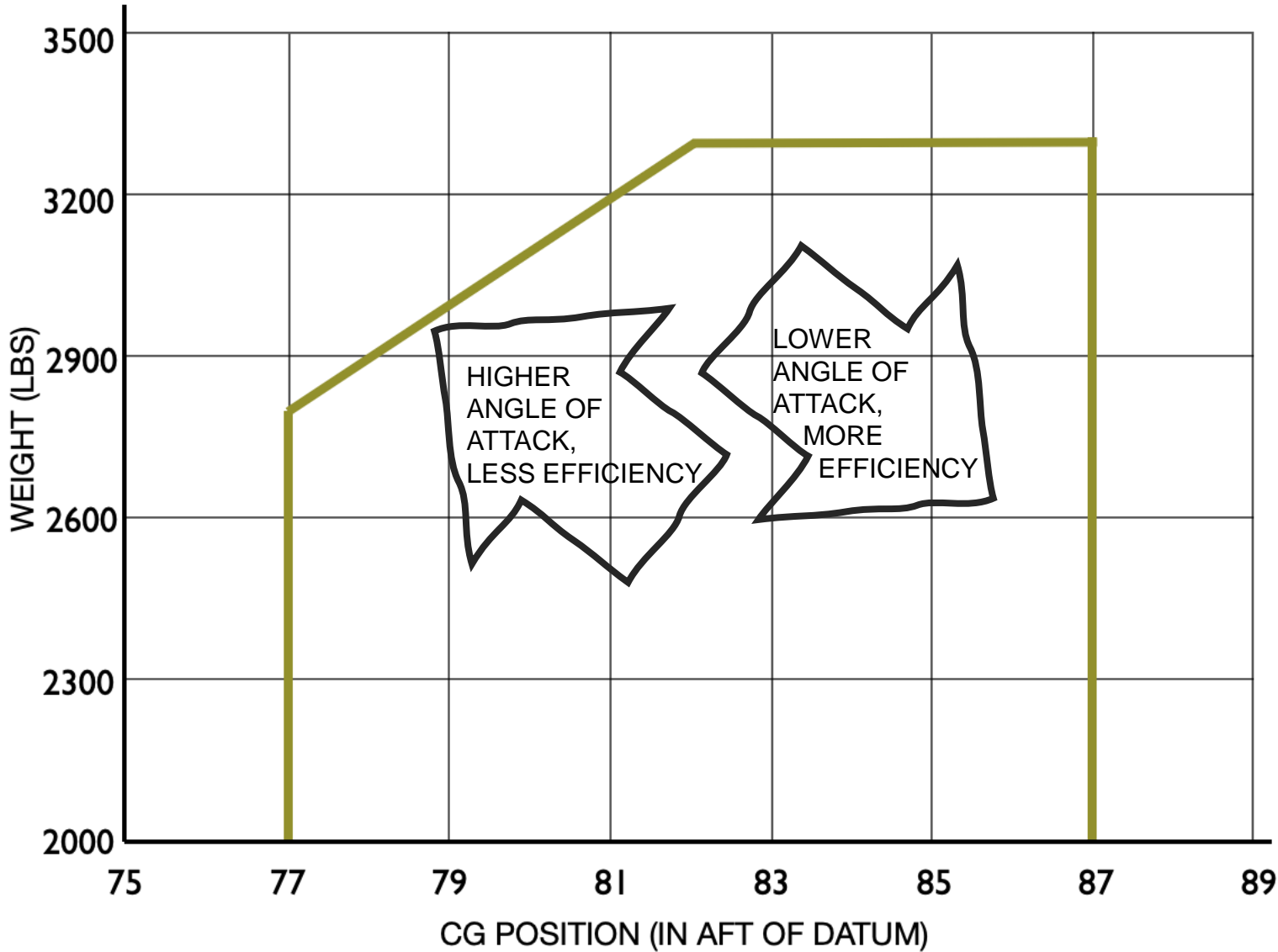




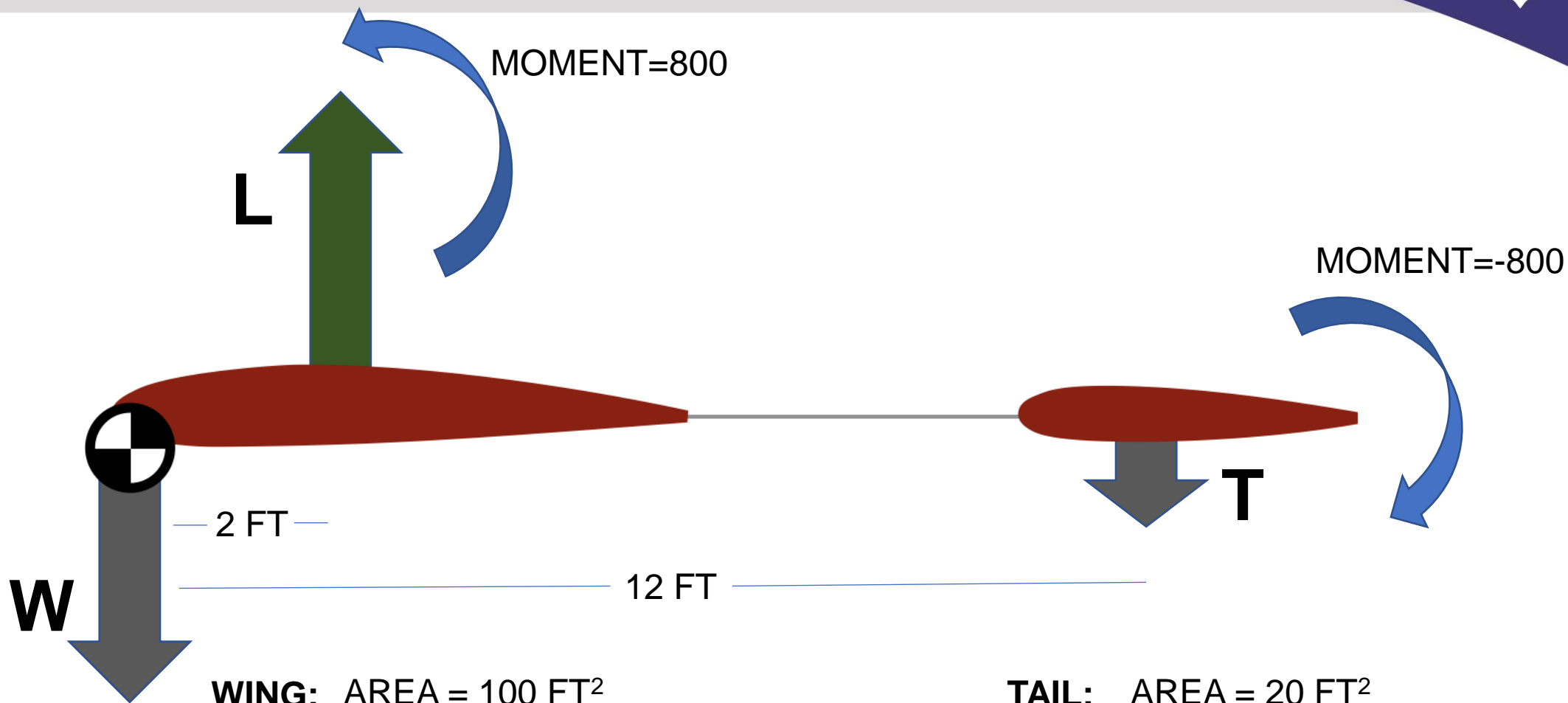






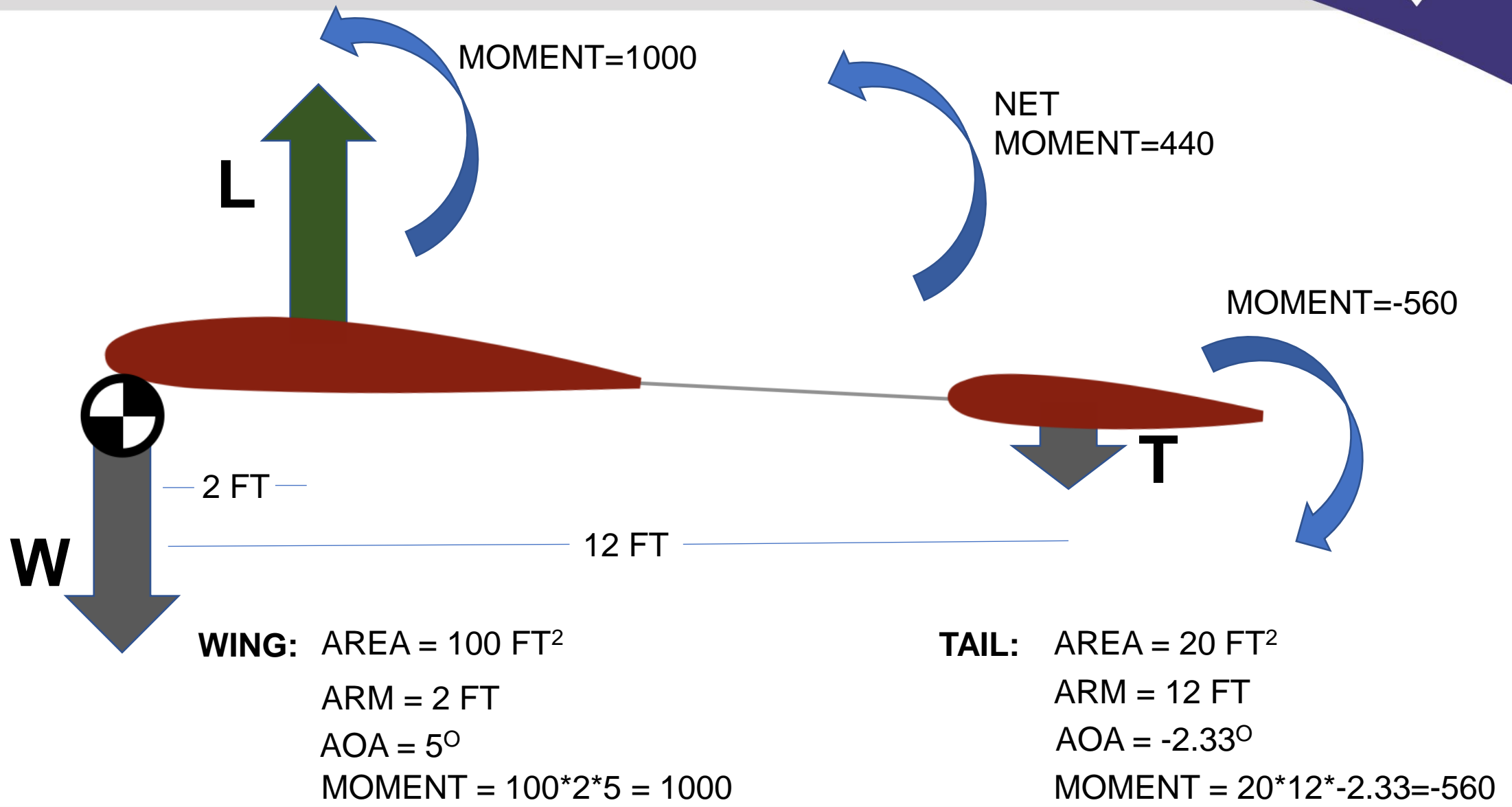


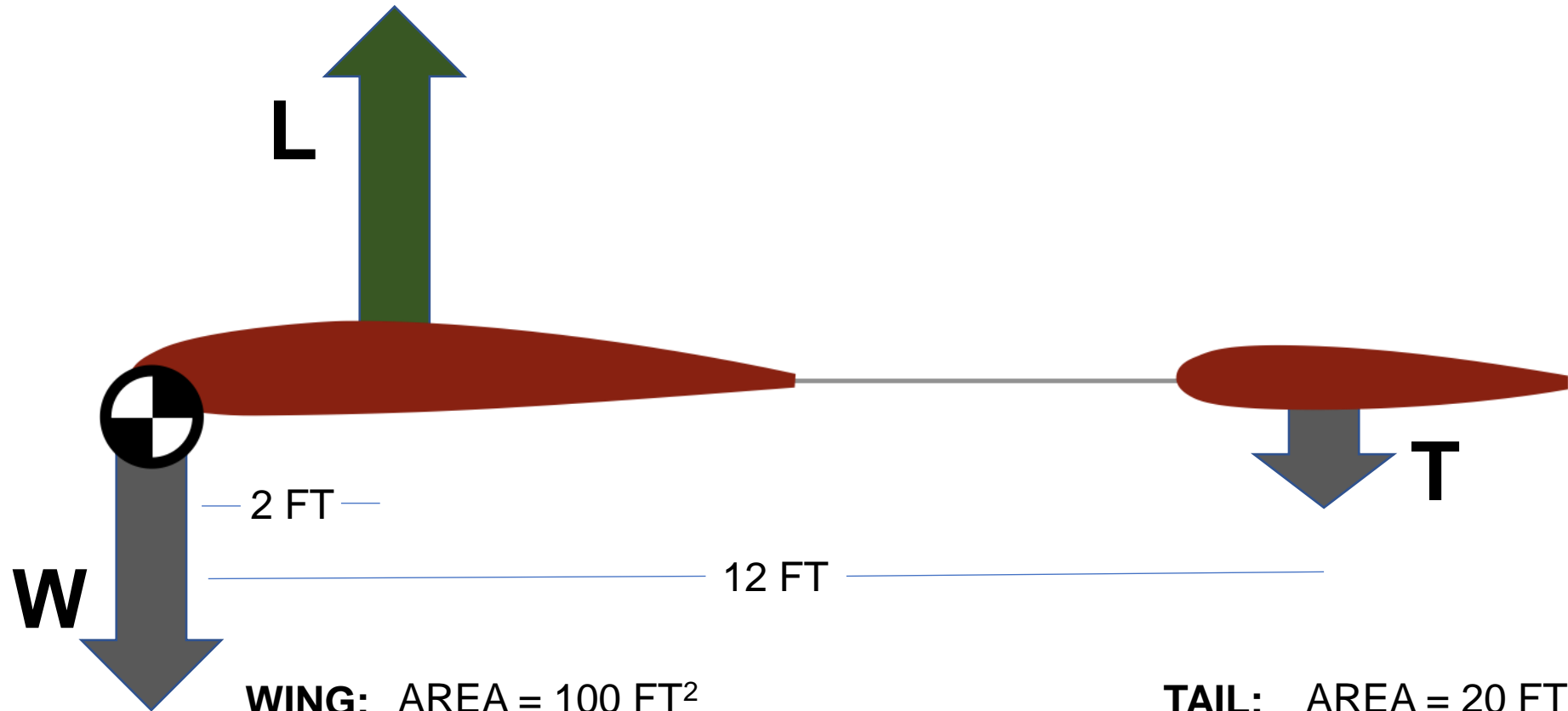
Beechcraft E33C



WING: AREA = 100 FT²
ARM = 2 FT
AOA = 4°
MOMENT = 100*2*4 = 800

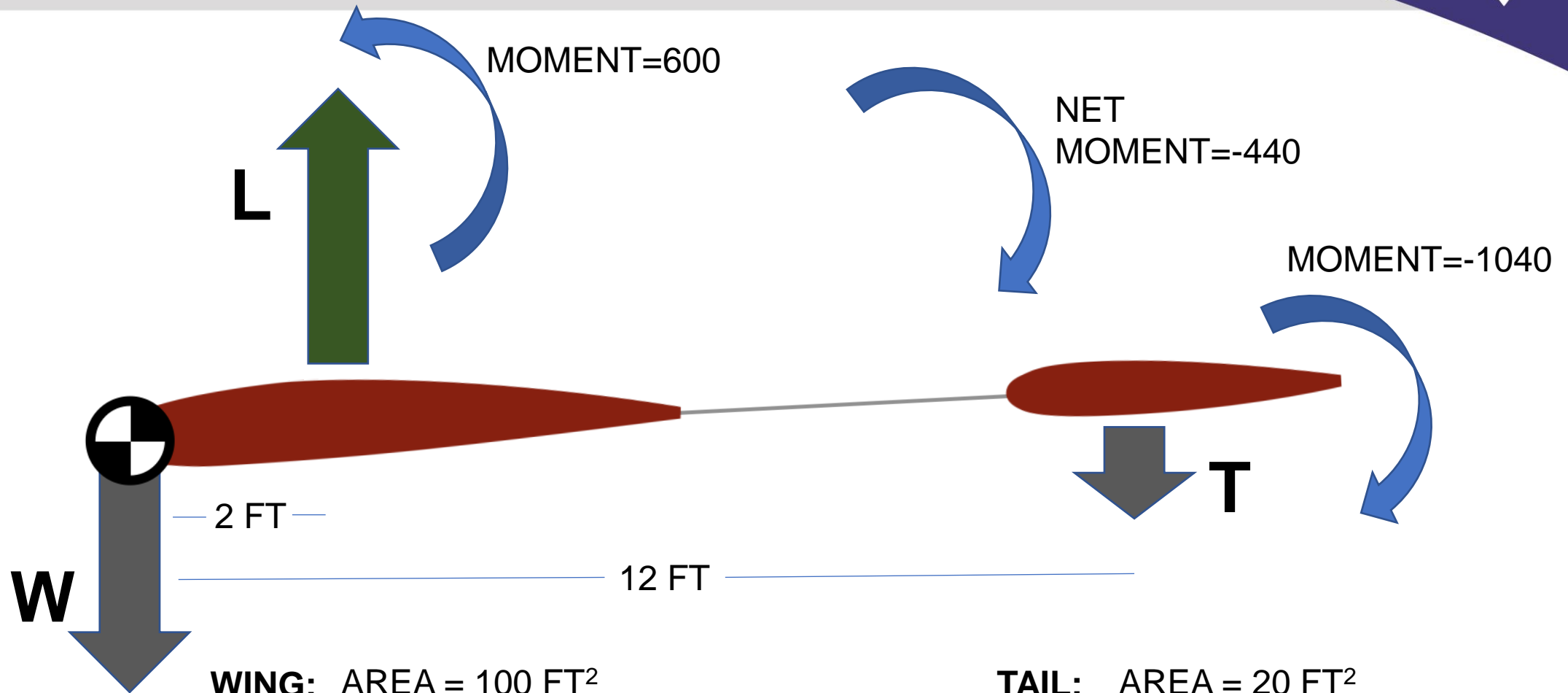
TAIL: AREA = 20 FT²
ARM = 12 FT
AOA = -3.33°
MOMENT = -800 = 20*12*AOA





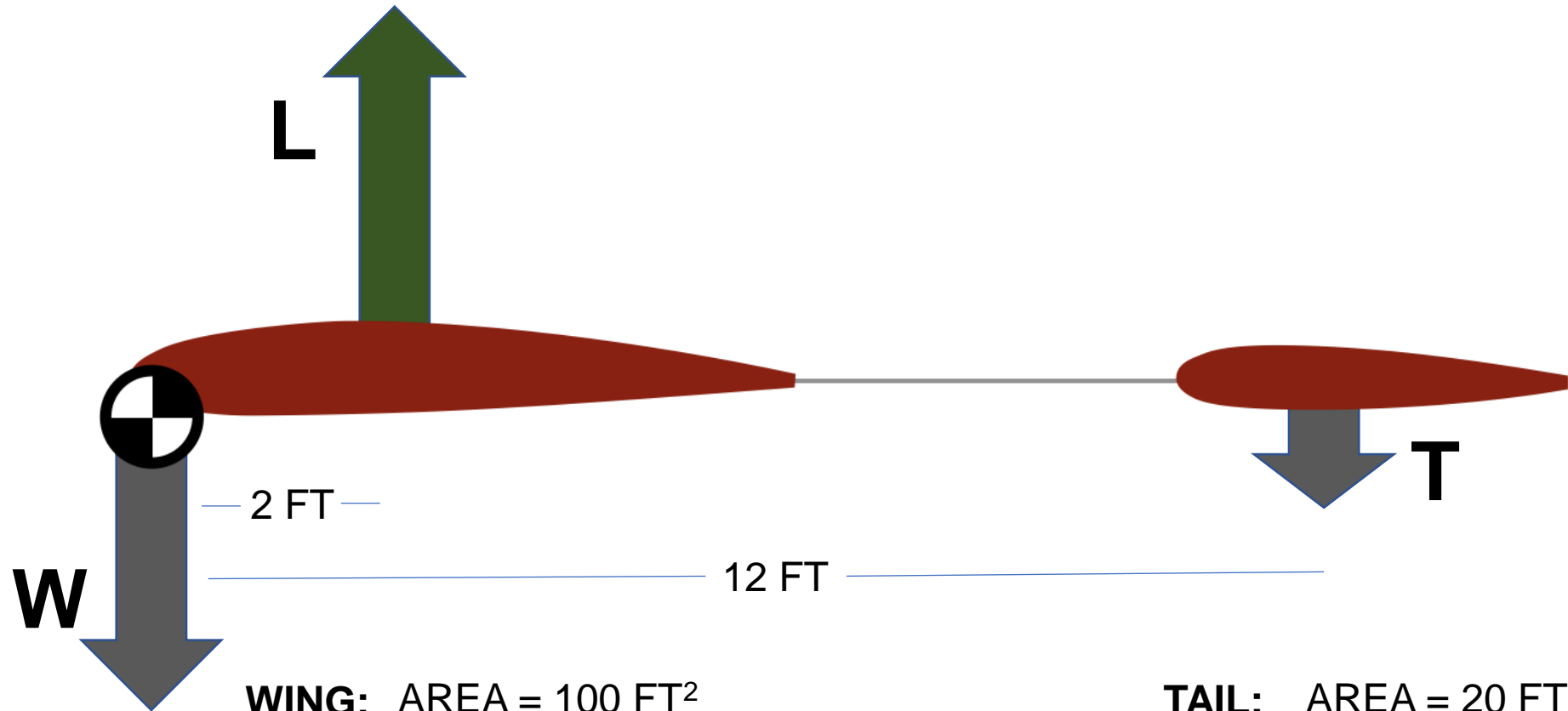
WING: AREA = 100 FT²
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MOMENT = 100*2*4 = 800

TAIL: AREA = 20 FT²
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MOMENT = -800



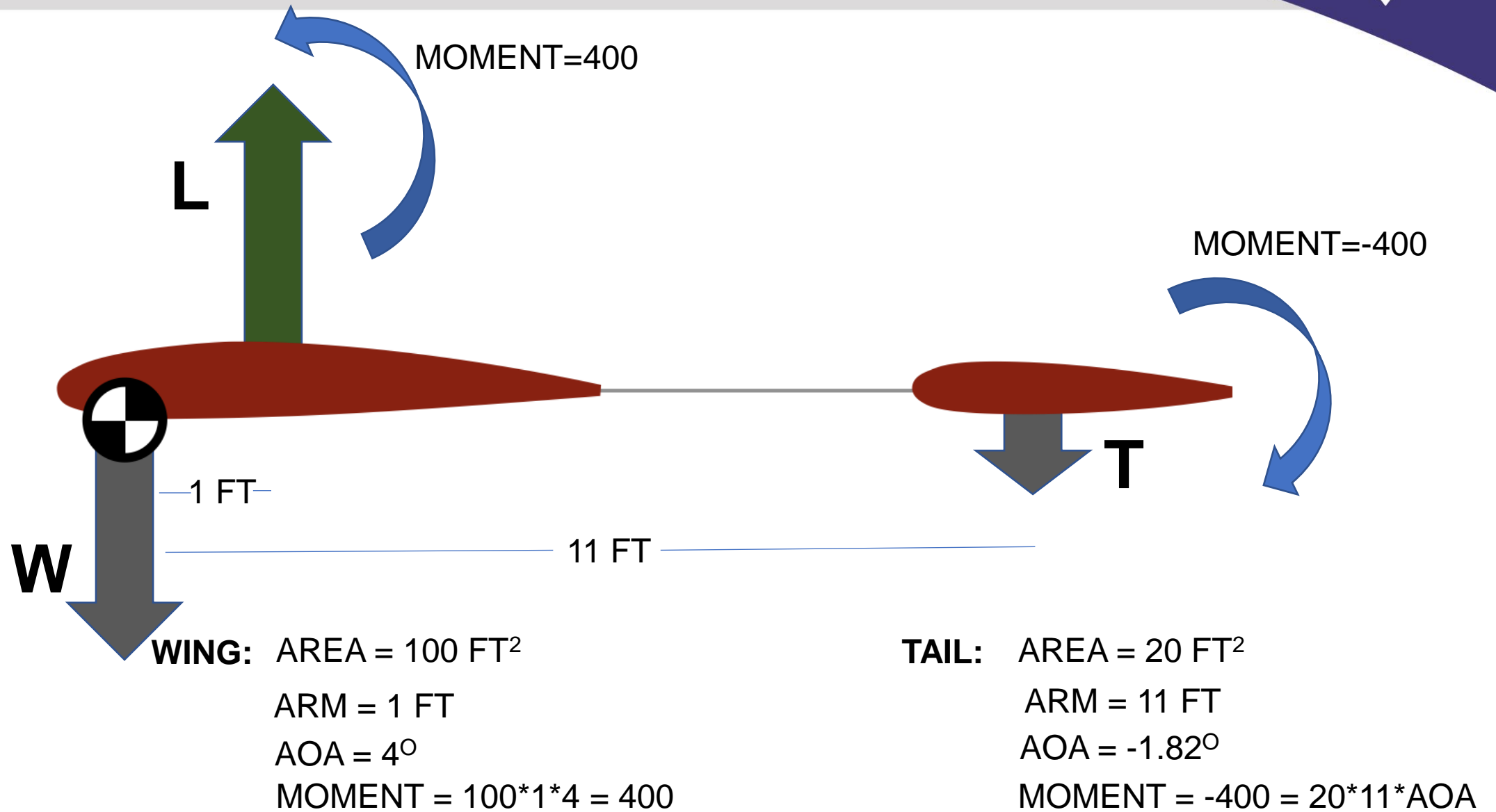
WING: AREA = 100 FT²
ARM = 2 FT
AOA = 3°
MOMENT = 100*2*3 = 600

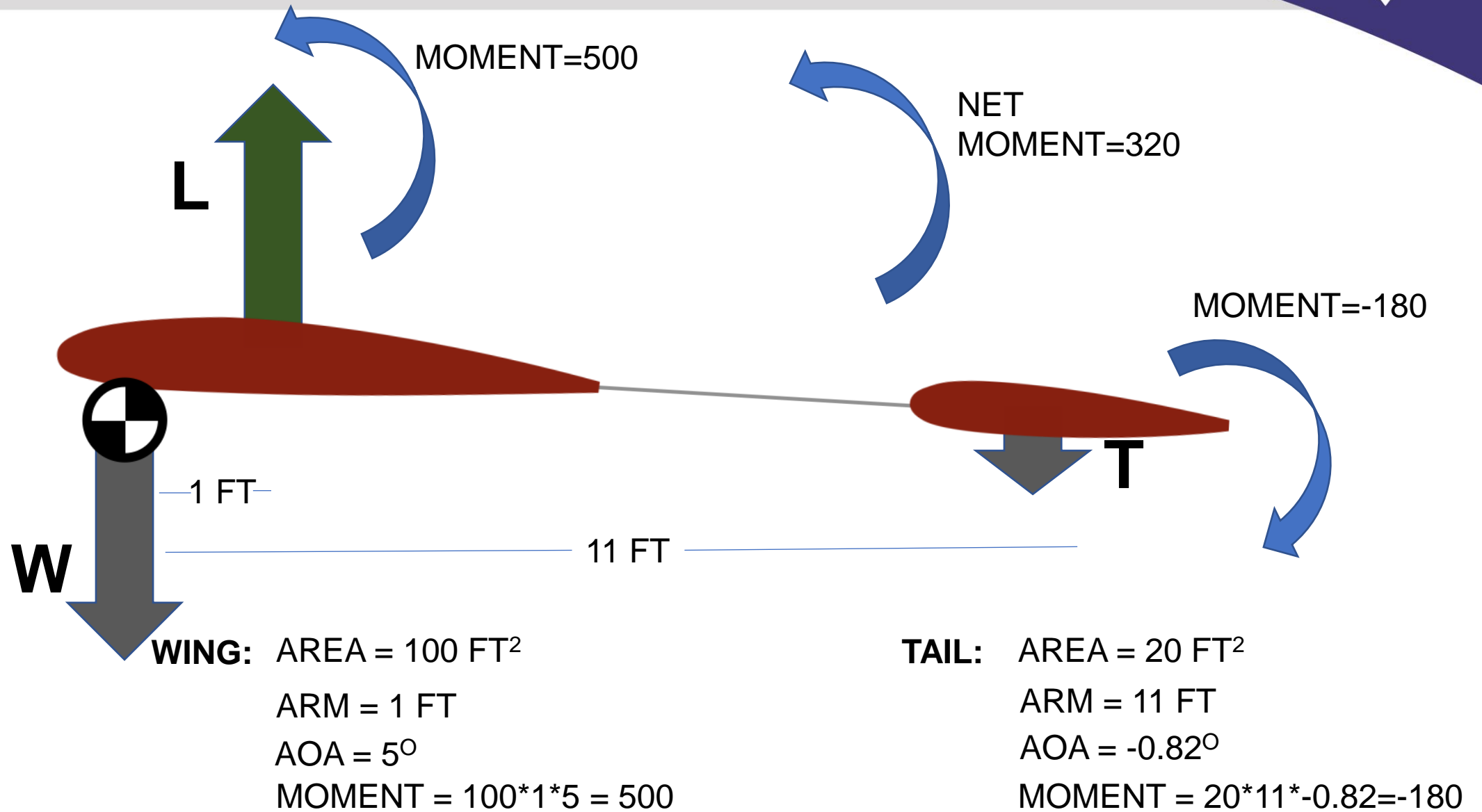
TAIL: AREA = 20 FT²
ARM = 12 FT
AOA = -4.33°
MOMENT = 20*12*-4.33=-1040

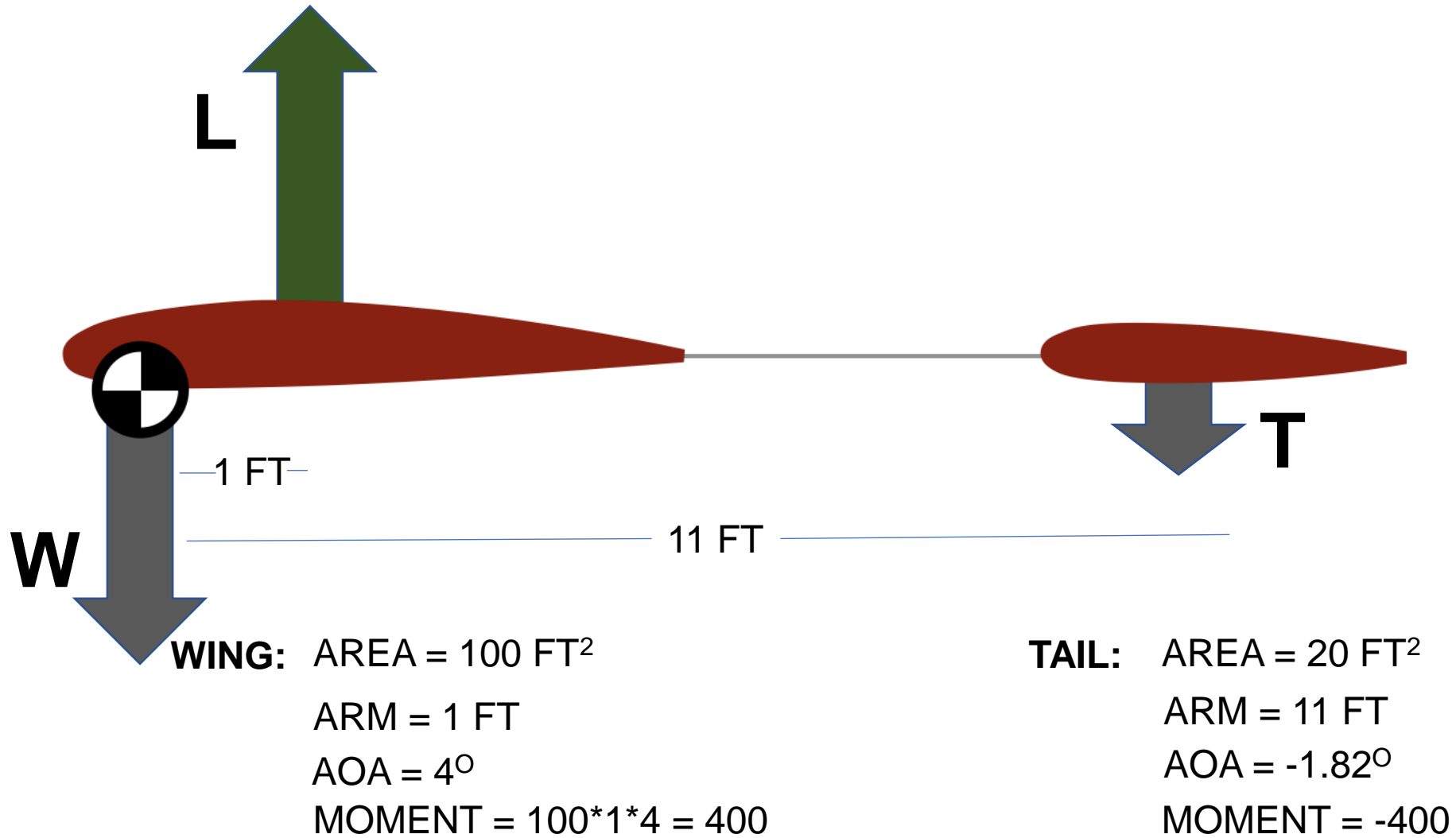


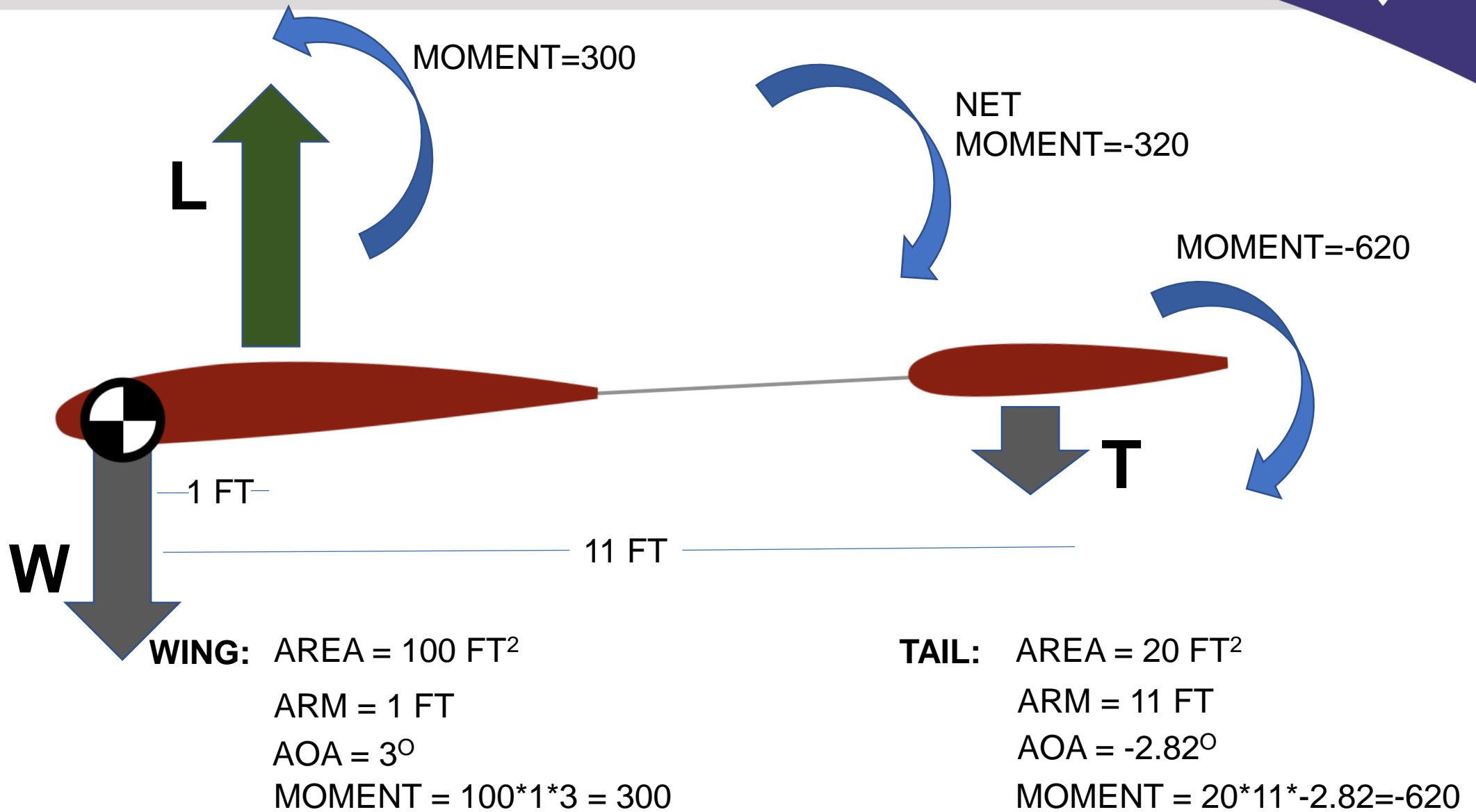
WING: AREA = 100 FT²
ARM = 2 FT
AOA = 4°
MOMENT = 100*2*4 = 800

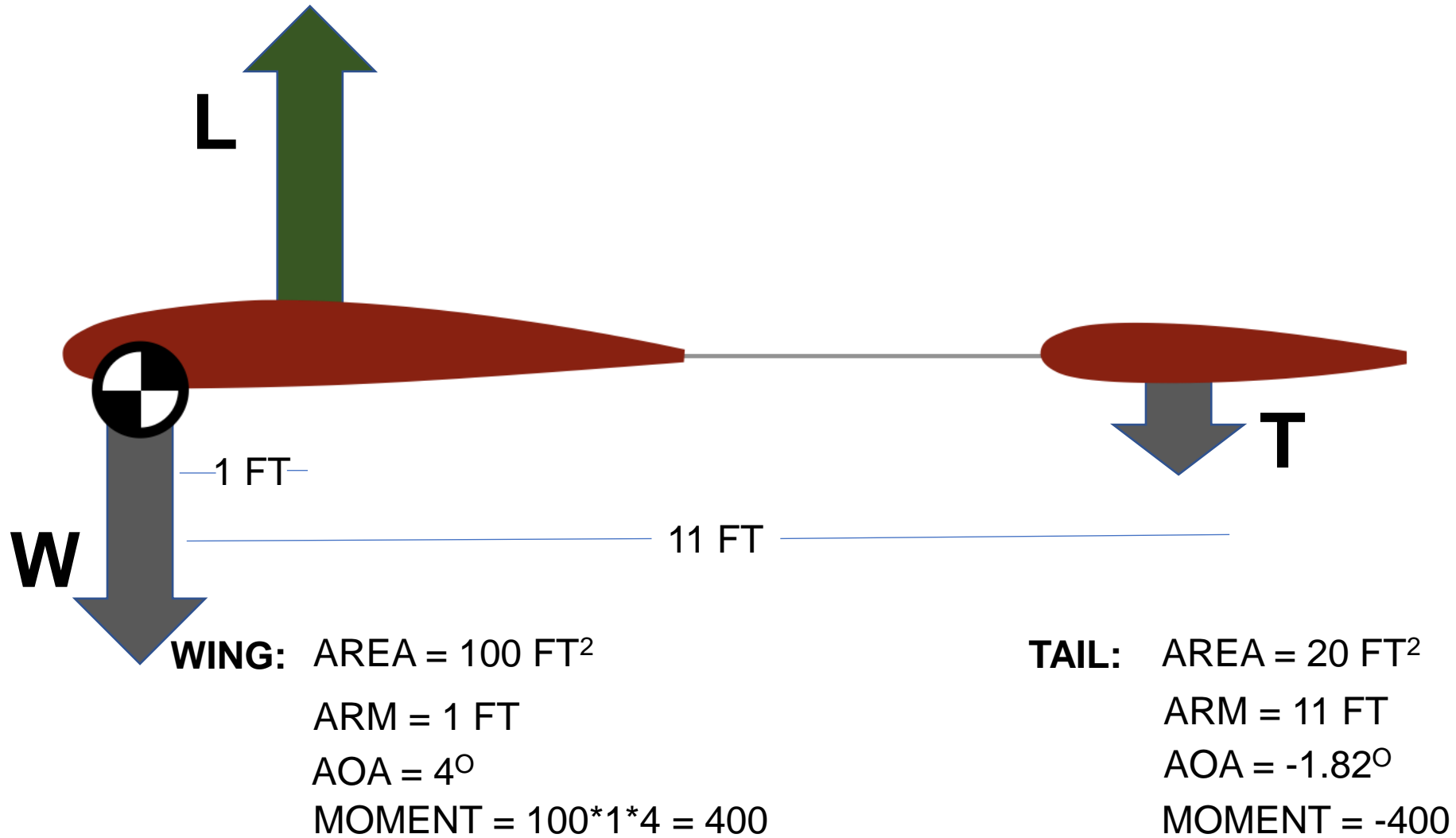
TAIL: AREA = 20 FT²
ARM = 12 FT
AOA = -3.33°
MOMENT = -800

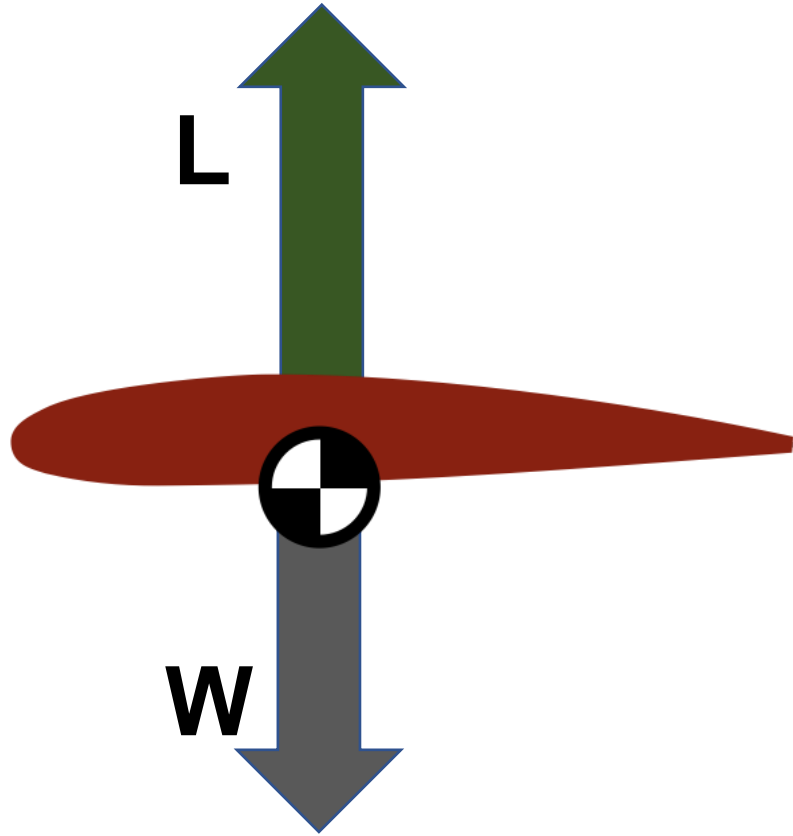


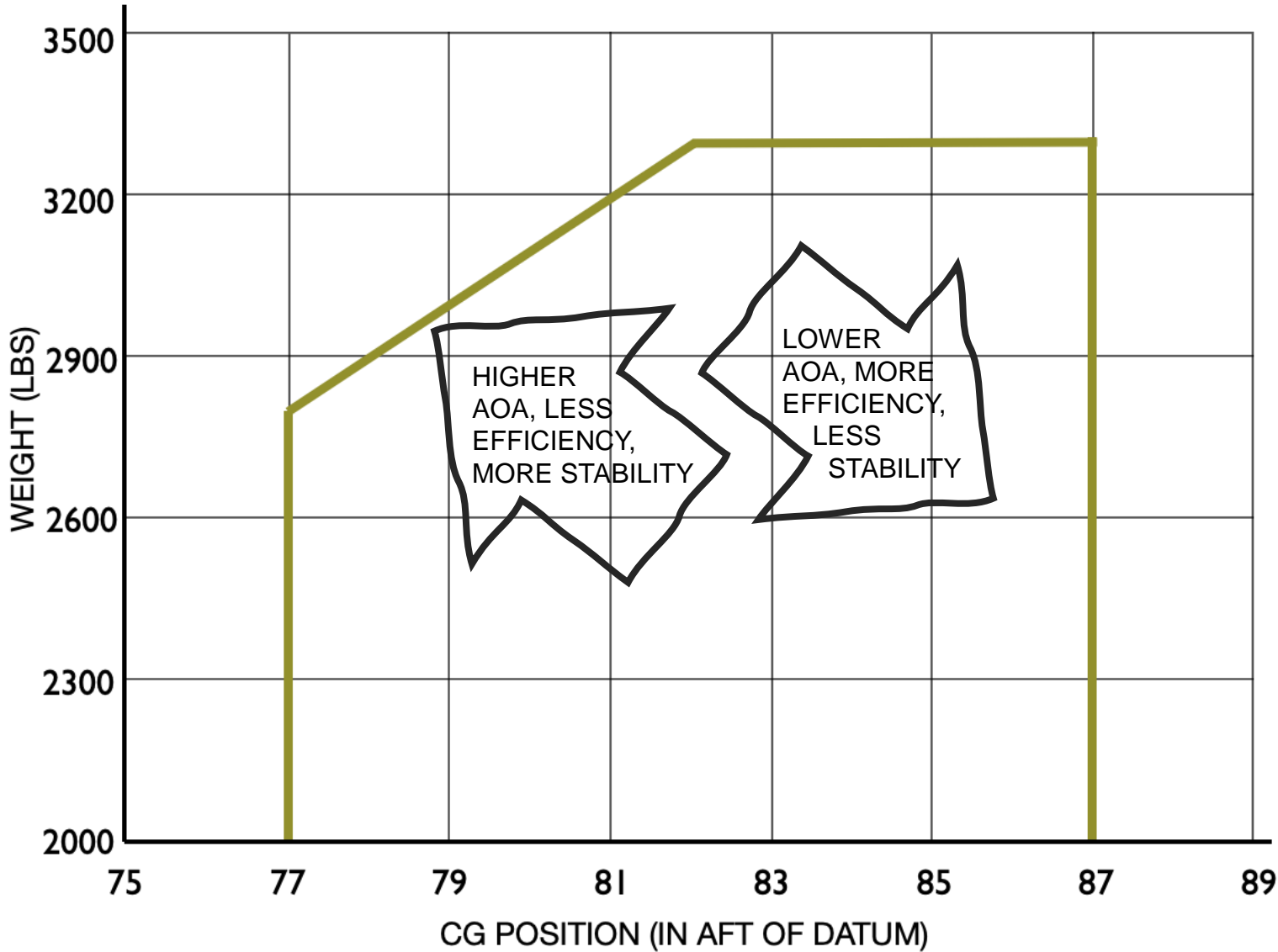




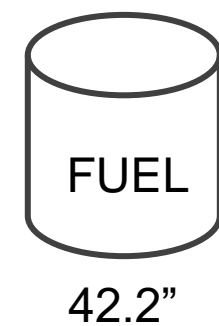
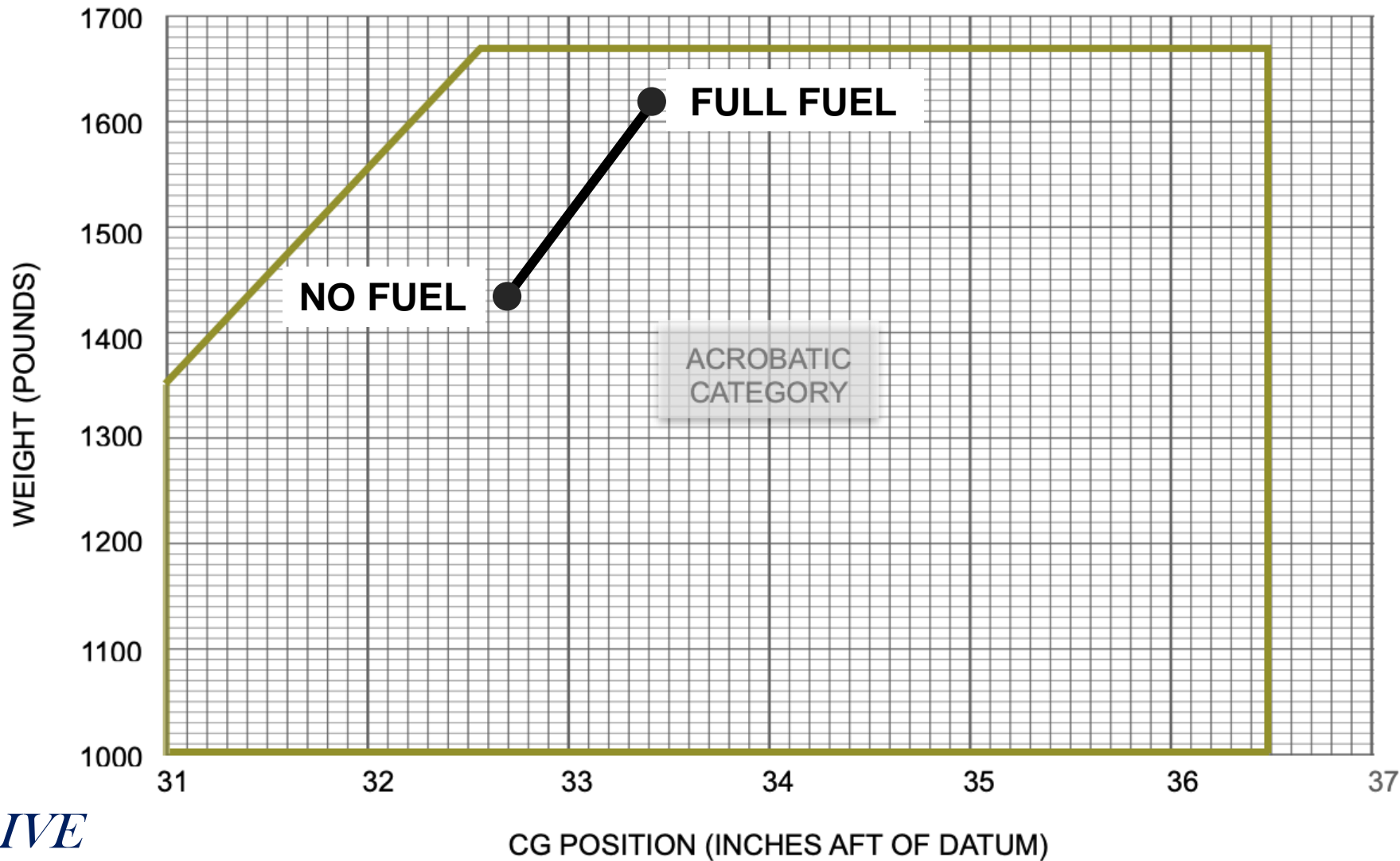




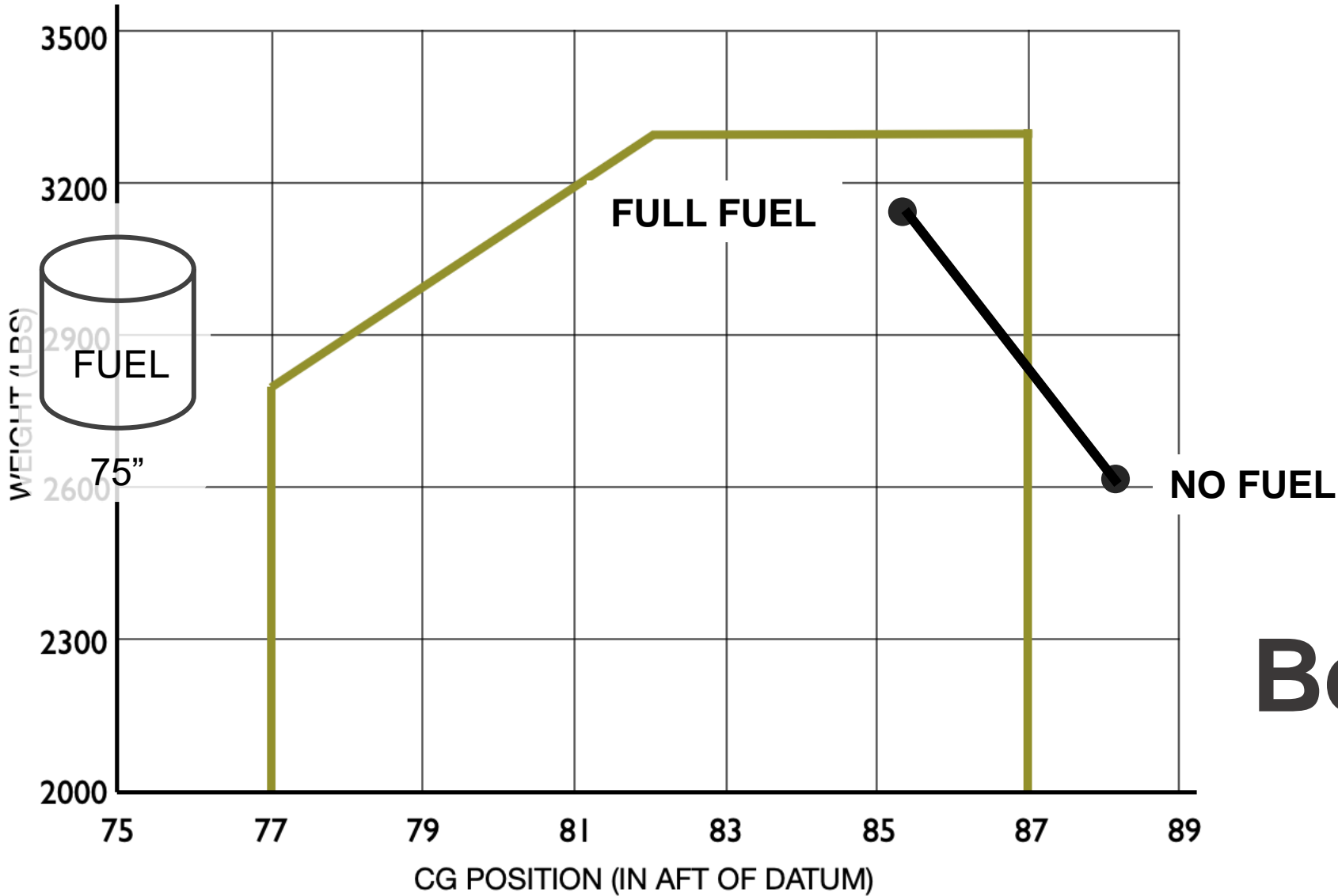




Beechcraft E33C



Cessna A152



**Beechcraft
E33C**

Weight and Balance

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New airplane, new W&B

Check that center of gravity

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THE AEROBATIC Beechcraft Bonanza *Niky* was a perfect fit for Catherine Cavagnaro and her family—once Cavagnaro made an avionics upgrade that changed the weight and balance and made more of the useful load available.

Takeoff Performance

What matters most

If a performance chart could talk

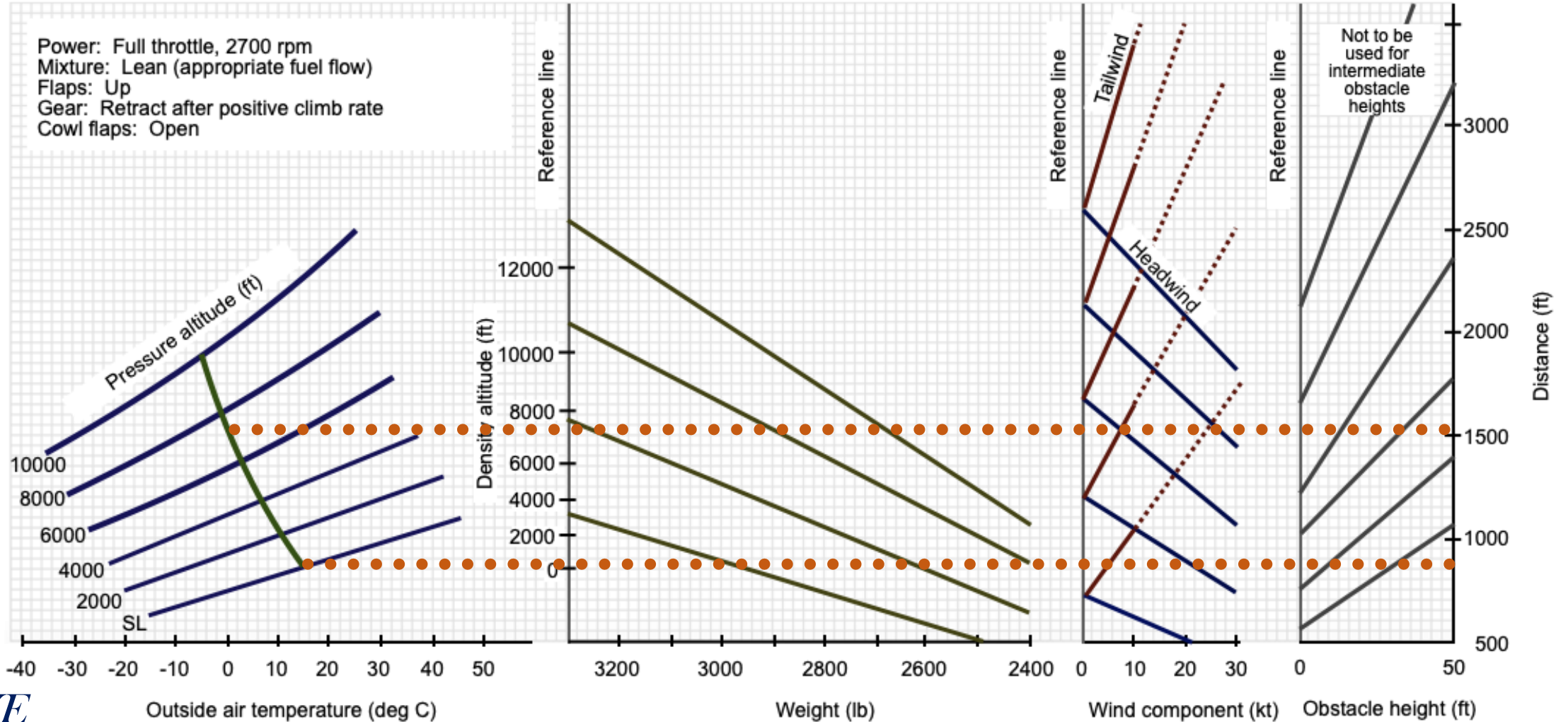
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JULY 2021

TAKEOFF DISTANCE (FT)



Pressure Altitude

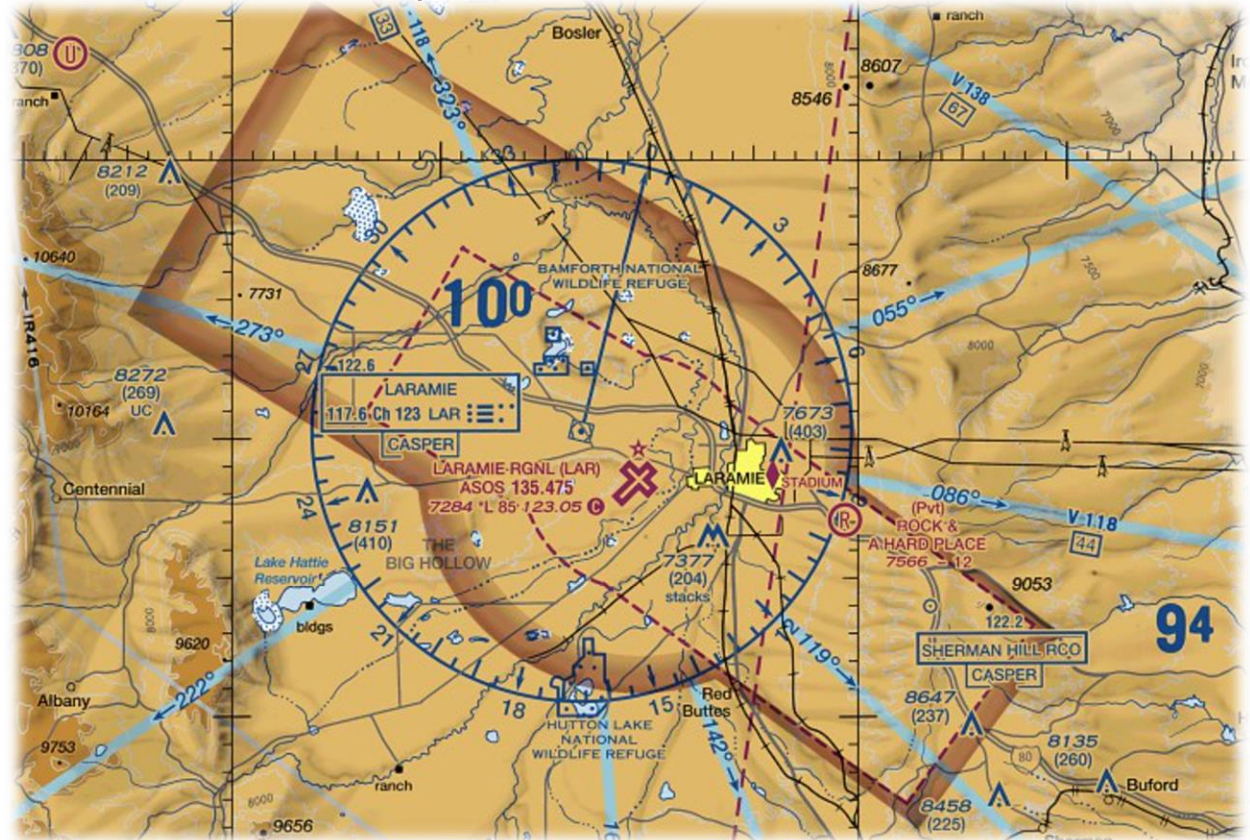
$$= \text{FIELD ELEVATION} + 1000(29.92 - \text{ALTIMETER SETTING})$$

$$= 7284 + 1000(29.92 - 30.32)$$

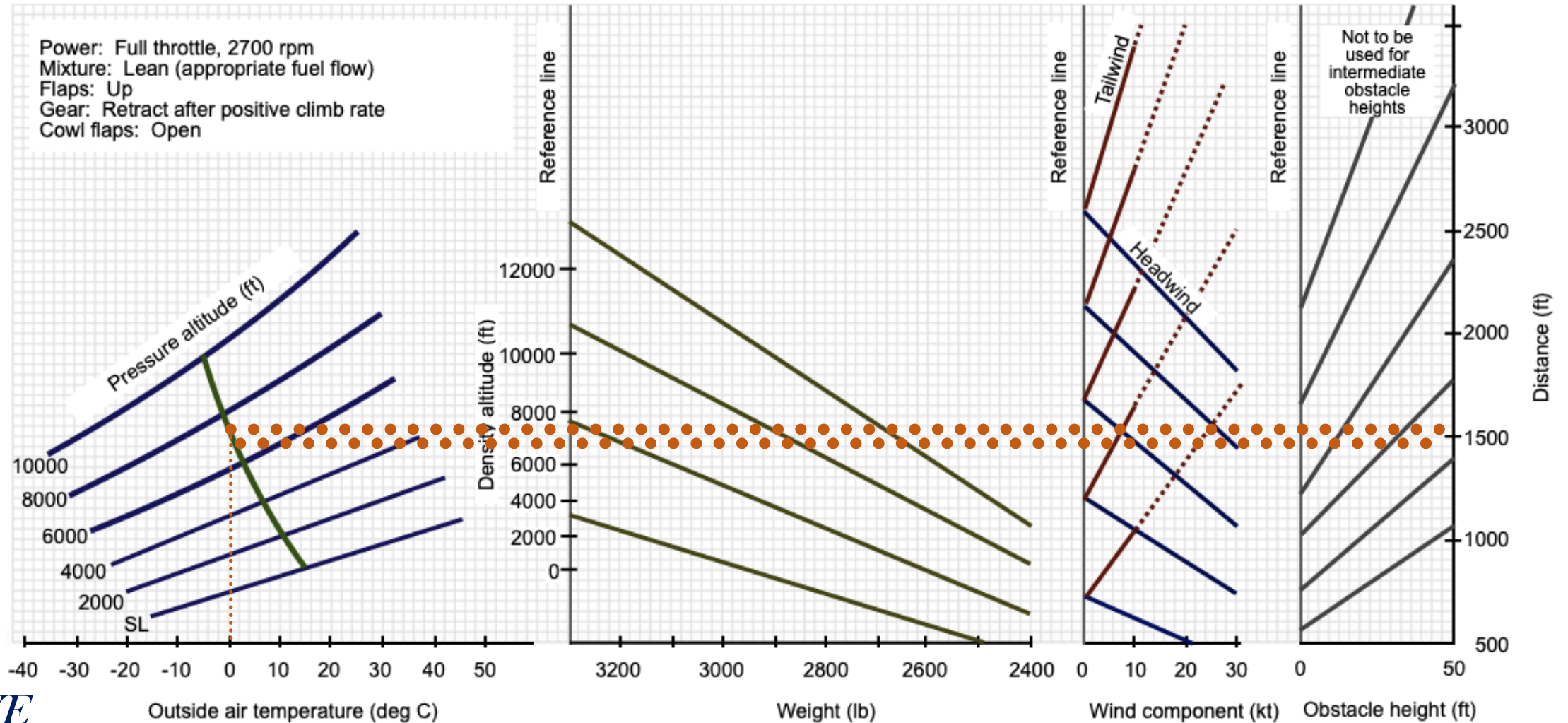
$$= 7284 + 1000(-0.40)$$

$$= 7284 - 400$$

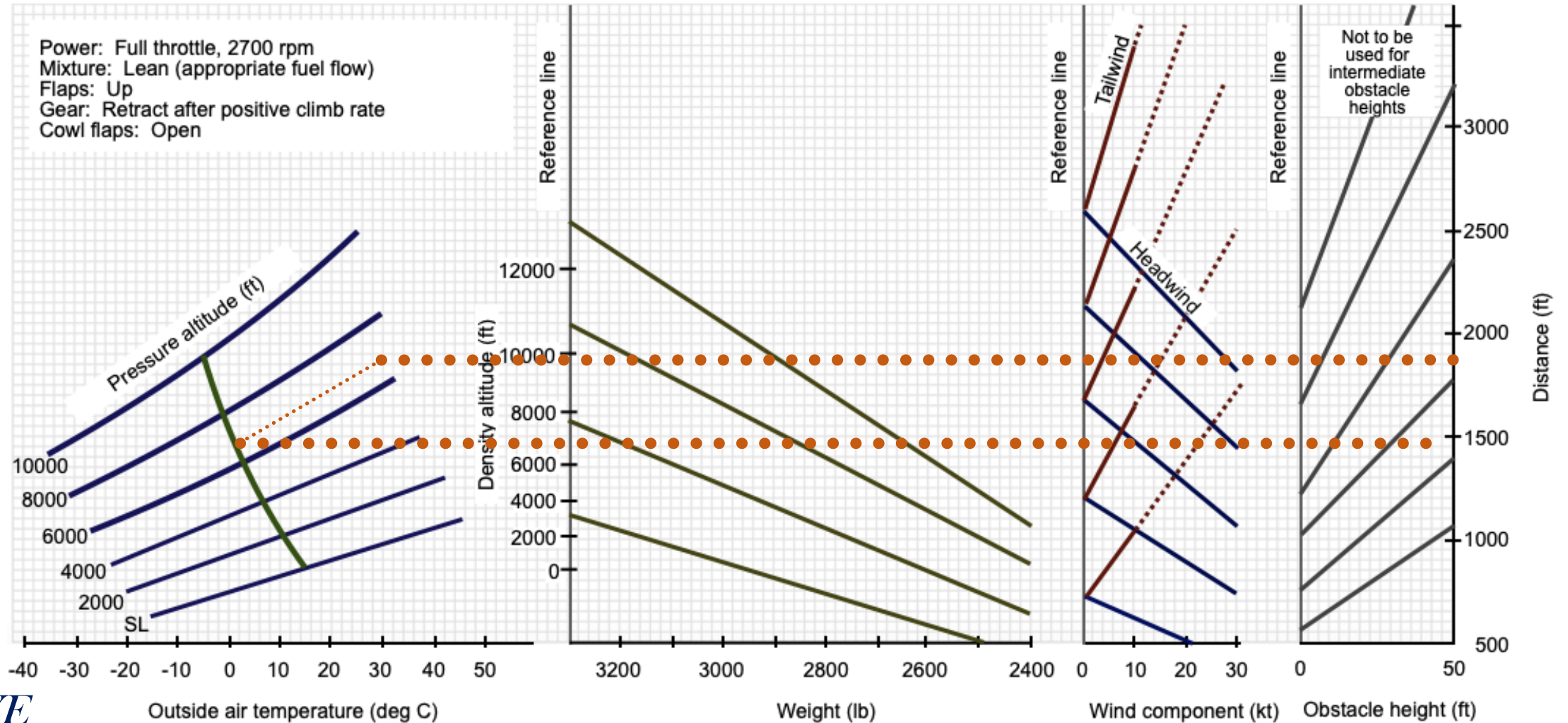
$$= 6884$$



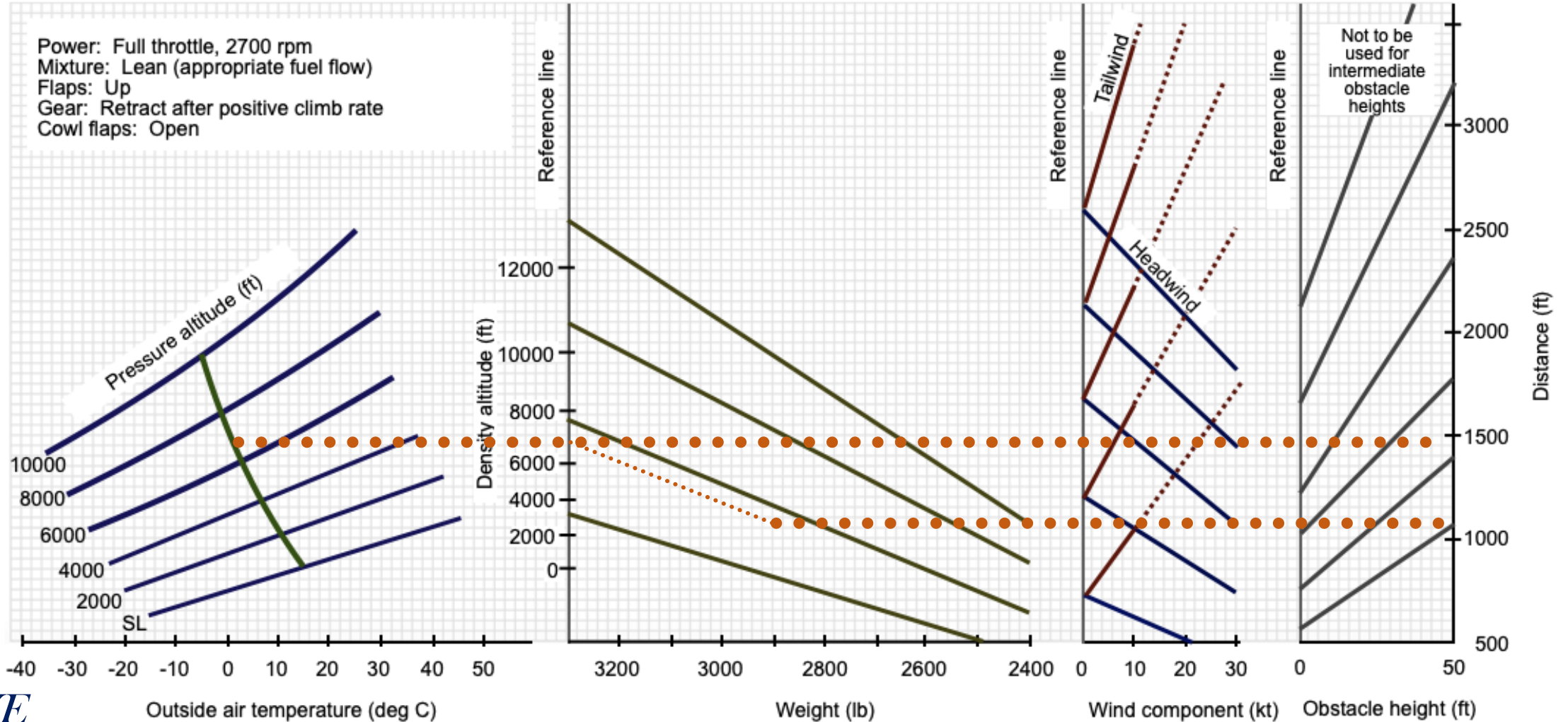
TAKEOFF DISTANCE (FT)



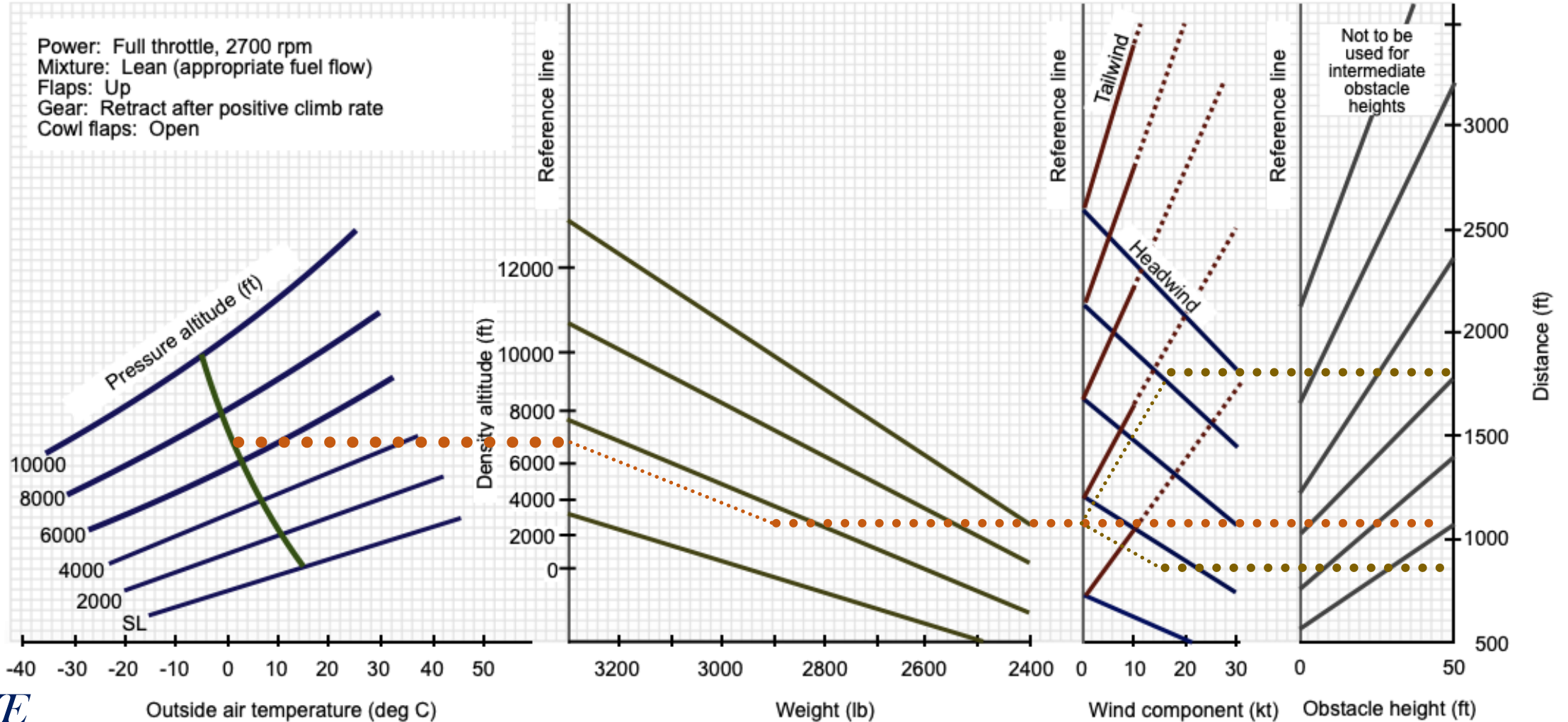
TAKEOFF DISTANCE (FT)



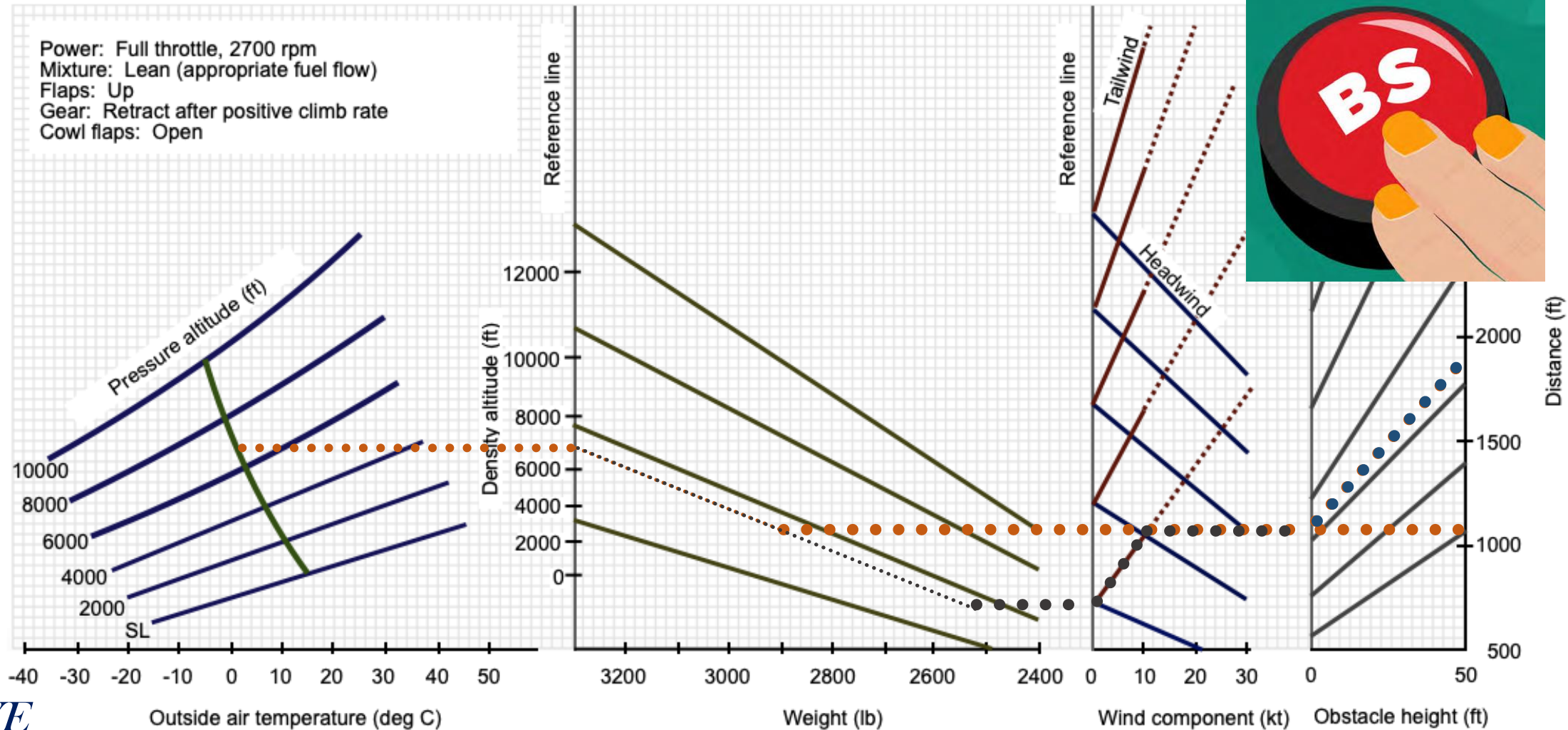
TAKEOFF DISTANCE (FT)



TAKEOFF DISTANCE (FT)



TAKEOFF DISTANCE (FT)



Takeoff Performance

What matters most

If a performance chart could talk

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JULY 2021

Learning to call BS

If it sounds too good to be true...

BY CATHERINE CAVAGNARO

Calling BS

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AOPA PILOT MAGAZINE
APRIL 2021



***If a Performance Chart
Could Speak:
Learning Your Airplane***

Thank you for attending!

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