Chapter 2, Question 5:
Integral Momentum Equation

A fighter aircraft is being refueled in mid-air by a tanker. The refueling boom enters the aircraft at an angle of 30 degrees from its flight path. The fuel flow rate through the boom is 20kg/s at a velocity of 30m/s relative the two aircraft. The density of the fuel is 700kg/m^3. What additional lift force is necessary to overcome the force on the fighter due to the momentum transfer during refueling?

1) $20*30*(\sin 30)^2$

2) $20*(30*\sin 30)^2$

3) $20*30*\sin 30$

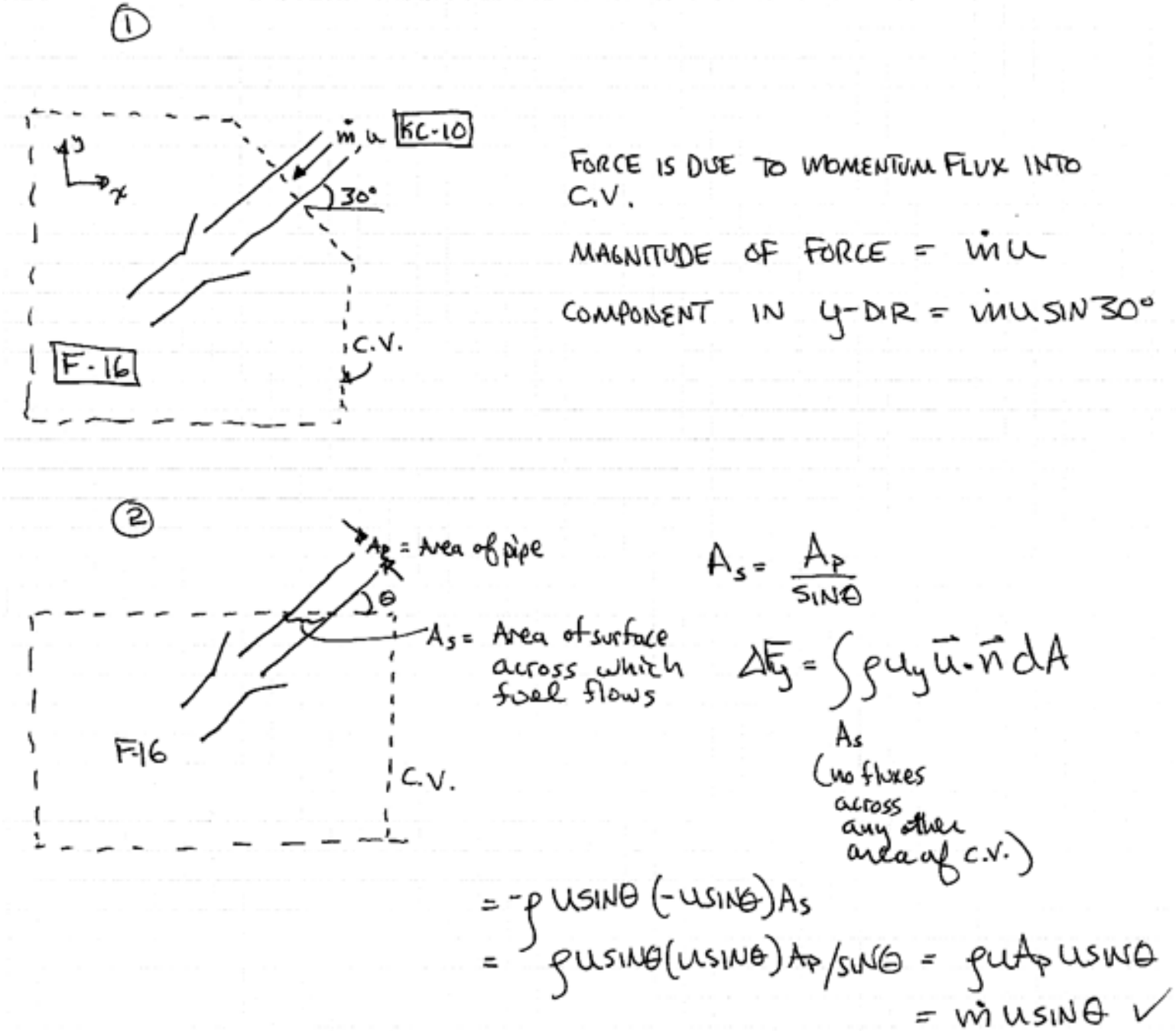
4) I don't know

L.O. B

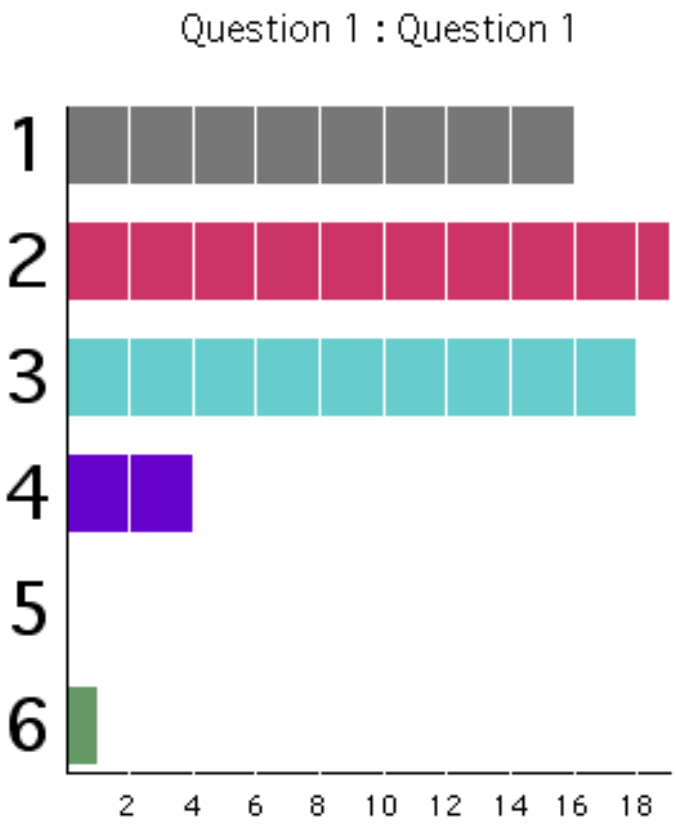
Chapter 2, Question 5 Answer:

The correct answer is 3) ΔF_y = massflow*velocity*sin(θ) = 20*30*sin(30)

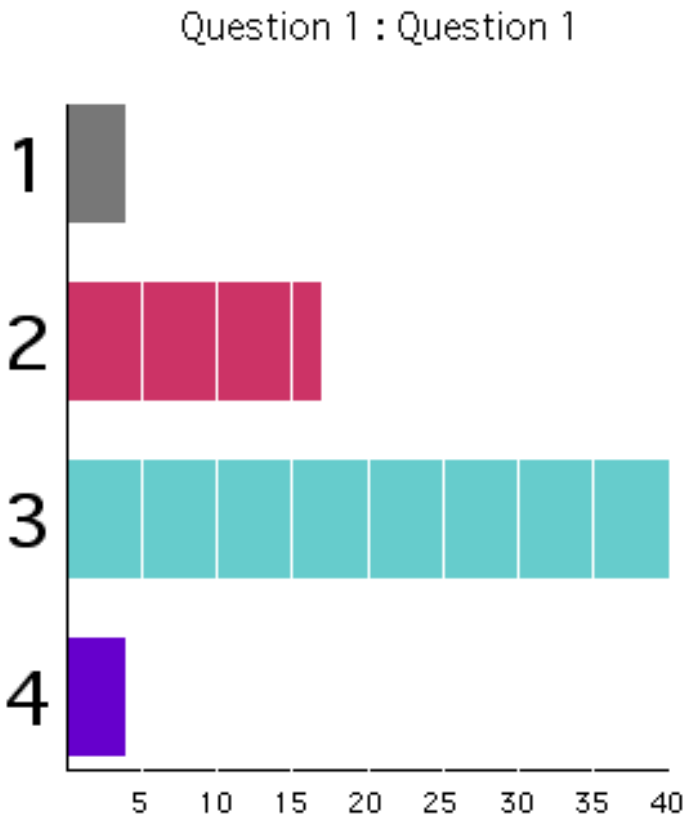
There are are two ways to arrive at this.:



Class performance (2004):



Class performance (2003):



Class performance (2001):