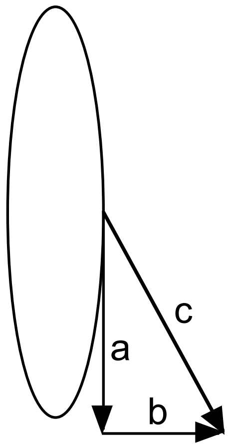

a = 6·π·2700·60/6076 = 503 kts

b = 200 kts

Notice that the two velocity vectors are orthogonal or perpendicular or at 90° angles to each other. Therefore the total speed is equal to the square root of the sum of the squares of the two individual speeds. As a final result, we are interested in the speed not the velocity of the prop tip. A velocity contains both a speed and a direction. Only the speed is of concern here.

Therefore we continue on to calculate the total speed at:

c = (a··2 + b··2)··1/2 = (503··2 + 200··2)··1/2
= (253009 + 40000)··1/2 = 293009··1/2
= 541 kts

Not quite mach 1. From our trusty E6B, we know that at sea level and 15° C, mach 1 equals 622 kts. Lets calculate the forward velocity x that we would need for the prop tip to reach mach 1.

(503··2 + x··2)··1/2 = 622··2
or
x = (622··2 - 503··2)··1/2 = 367 kts

How about mach .9.

x = ((622·.9)··2 - 503··2)··1/2 = 246 kts

Scott, Forget about it.

Rick, Watch out.