A flat sheet (tabular) iceberg drifts over the ocean as it is driven by the wind that blows over the top. The temperature of the surrounding seawater is 10^0C, and the relative velocity between it and the iceberg is 10cm/s. The length of the iceberg in the direction of drift is L=100m Calculate the corresponding wind velocity when the atmospheric air temperature is 40^0C. (Make suitable assumptions to simplify the problem and state them).

In[•]:=
```
TMeanAir = (40 + 0)/2; TMeanWater = (10 + 0)/2; L = 100;
water = {μ → ThermodynamicData["Water", "Viscosity",
       {"Temperature" → Quantity[TMeanWater, "DegreesCelsius"]}][[1]],
   ρ → ThermodynamicData["Water", "Density", {"Temperature" →
         Quantity[TMeanWater, "DegreesCelsius"]}][[1]], U → 0.1, x → L};
air = {μ → ThermodynamicData["Air", "Viscosity",
       {"Temperature" → Quantity[TMeanWater, "DegreesCelsius"]}][[1]],
   ρ → ThermodynamicData["Air", "Density",
       {"Temperature" → Quantity[TMeanWater, "DegreesCelsius"]}][[1]], x → L};
Re_x = ρ U x / μ;
Cf_x = 0.0624 / Re_x^(1/5);
Cf_L = 1/L ∫_0^L Cf_x dx;
F_D = ρ U^2 L Cf_L / 2;
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In[•]:=
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eqn = Simplify[(F_D /. water) == (F_D /. air), x > 0]
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Out[•]=
$$1.\, U^{9/5} == 8.03215$$

In[•]:=
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Solve[eqn, U][[1]][[1]][[2]] + 0.1
 (*the solution will be only the relative velocity so 0.1 is added*)
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Out[•]=
$$3.28188$$