

32. In the solution to exercise 4, we found that the force provided by the wind needed to equal  $F = 157$  N (where that last figure is not “significant”).

- (a) Setting  $F = D$  (for Drag force) we use Eq. 6-14 to find the wind speed  $V$  along the ground (which actually is relative to the moving stone, but we assume the stone is moving slowly enough that this does not invalidate the result):

$$V = \sqrt{\frac{2F}{C\rho A}} = \sqrt{\frac{2(157)}{(0.80)(1.21)(0.040)}}$$

which yields  $V = 90$  m/s which converts to  $V = 3.2 \times 10^2$  km/h.

- (b) Doubling our previous result, we find the reported speed to be  $6.5 \times 10^2$  km/h, which is not reasonable for a terrestrial storm. (A category 5 hurricane has speeds on the order of  $2.6 \times 10^2$  m/s.)