

Name: _____

1. The speed v at which air comes out of the windpipe in a cough is given by the formula

$$v = 20(6 - r)r^2,$$

where r is the radius of the windpipe at the moment of the cough. What value of r maximizes the speed?

2. A ball tossed straight into the air reaches a height of $80t - 16t^2$ feet after t seconds. What is the acceleration of the ball at time $t = 1$? Make sure your answer is given in the appropriate units.