A race car enters a flat 200-m radius curve at a speed of 20.0 m/s while increasing its speeds at a constant 2.00 m/s^2. if the coefficient of static friction is 0.700, what will the speed of the car be when the car begins to slide?

Car will start sliding when the force of inertia (acts on the car when it move on a curve) will be equal to the force of friction:

$$F_i = F_{fr}$$

$$F_{fr} = \mu N = \mu M g$$

where μ - coefficient of friction, N – normal force, M – mass of the car.

$$F_i = M a_r = M \frac{v^2}{r}$$

where a_r – radial acceleration.

$$M \frac{v^2}{r} = \mu M g$$

$$\frac{v^2}{r} = \mu g \rightarrow v = \sqrt{\mu g r}$$

$$v = \sqrt{0.7 * 9.8 m/s^2 * 200m} = 37.04 \, m/s$$

Answer: $v = 37.04 \, m/s$