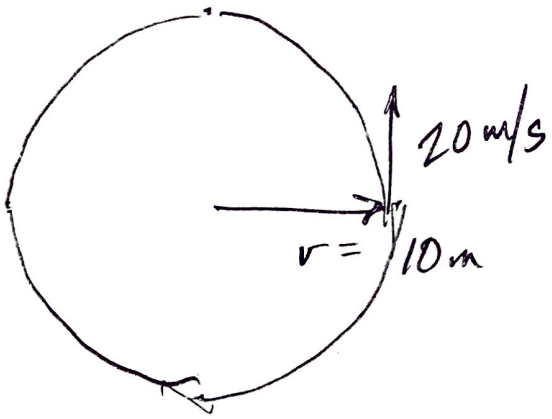
Chapter 4, # 61

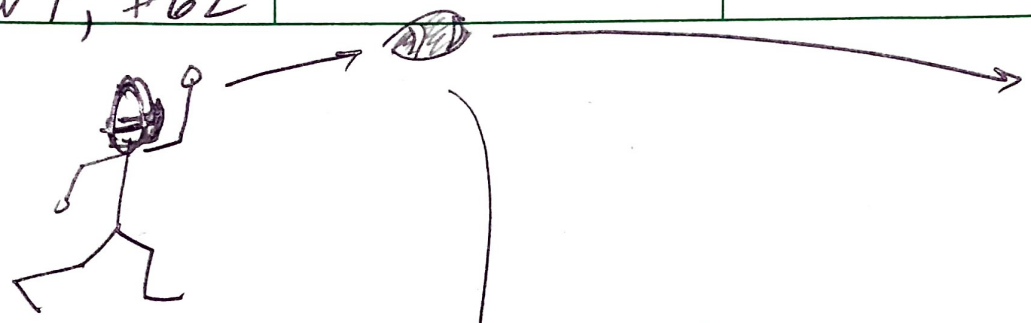
4.61



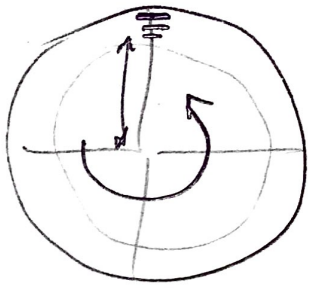
$$a_c = \frac{v^2}{r} = \frac{(20\,m/s)^2}{10\,m} = \frac{400}{10} = \boxed{40\,m/s^2}$$

Chapter 4, #62

4.62



Cam Newton?



View of football from one end.

$V = 8.0 \frac{rev}{s}$

$r = 8.5 cm = 0.085 m$

$a_c = \frac{v^2}{r}$

$a_c = \frac{(4.27 m/s)^2}{0.085 m}$

$= \boxed{215 m/s^2}$

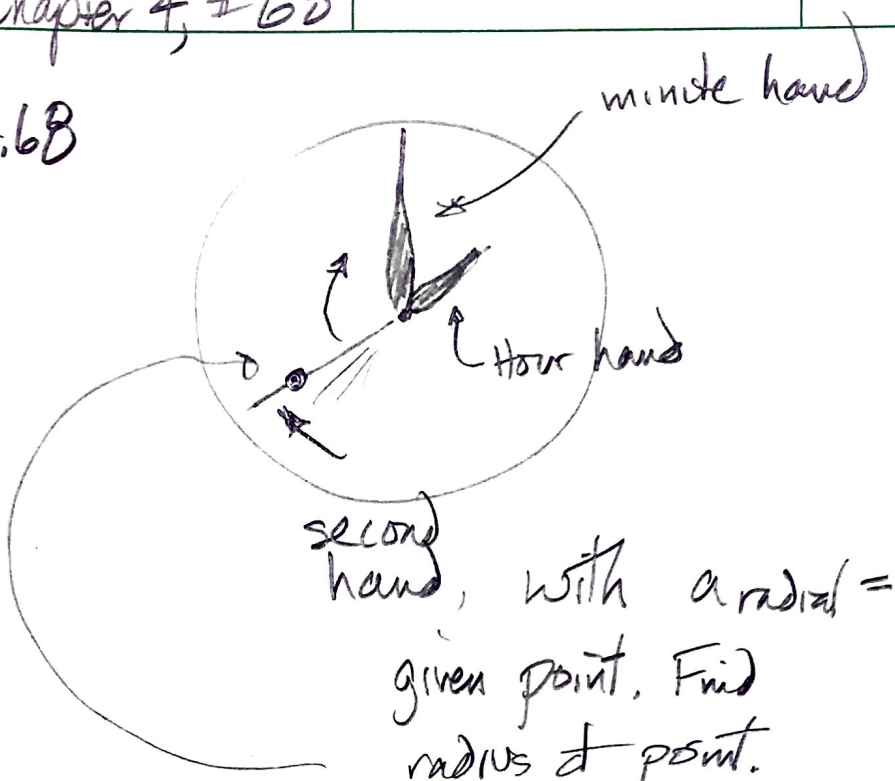
$V_{laces} = 8.0 \frac{rev}{s} \times \frac{2\pi(r)}{1 rev}$

$= \frac{16\pi(0.085)}{s}$

$= \boxed{4.27 m/s}$

Chapter 4, #68

4.68



, with $a_{radial} = \frac{0.1\,cm}{s^2}$ for a given point. Find radius of point.

What's the velocity of that point?

$$v = \frac{d}{t} = \frac{(2\pi r)\,m}{60\,s}$$

$$v = (0.1047\,r)\,\frac{m}{s}$$

(Don't know radius, yet!

$a = \frac{v^2}{r}$, so $r = \frac{v^2}{a}$

$$r = \frac{(0.1047\,r)^2\,m^2/s^2}{\left(\frac{0.001\,m}{s^2}\right)}$$

$$\frac{0.001\,m/s^2}{0.1047^2} = r$$

$$\boxed{0.091\,m} = r$$

$$= 9.1\,cm$$