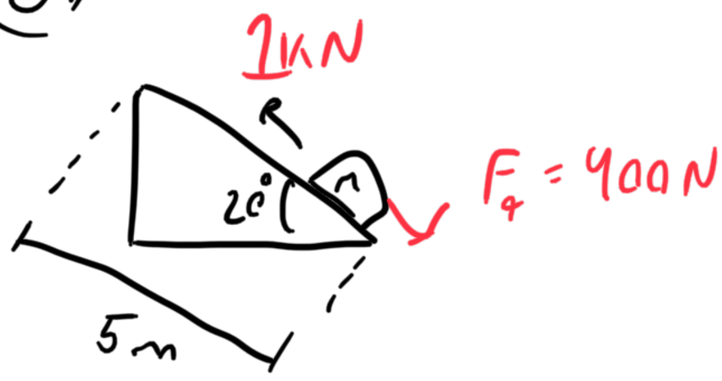
6, 8, 12, 16, 18, 21, 22, 24

(6.)



$\Sigma F_{along} = 600N$

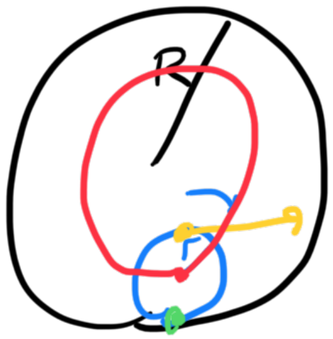
$W = Fl = 3kJ$

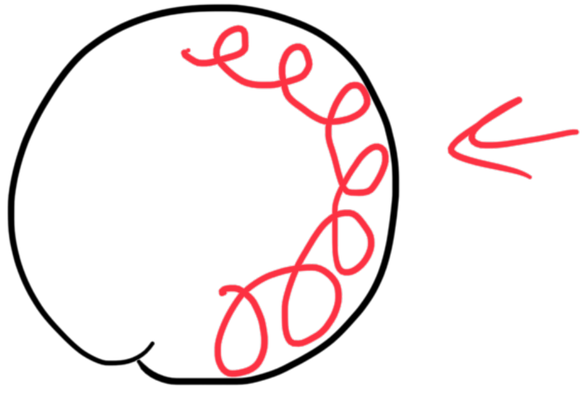
$U = mg\Delta h = 1,970J$

$K = W - U = 1,030J$

$= \frac{1}{2}mv^2 \Rightarrow v = 9.24 m/s$

8.





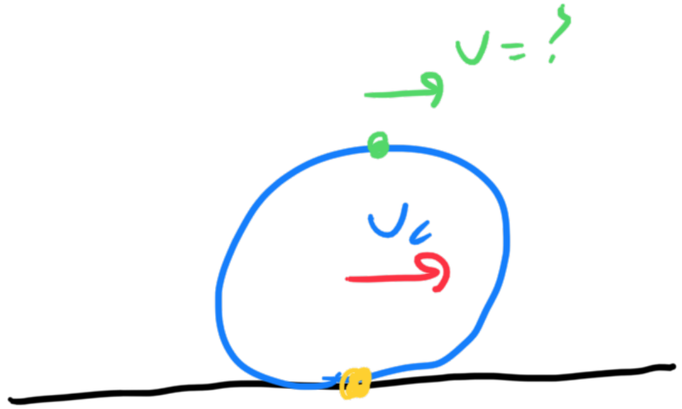
$w = v/r$

Circumference $= 2\pi(R-r)$

$$v_c = \frac{2\pi(R-r)}{T}$$

$v_{opp} = 2v_c$

$$= \frac{4\pi(R-r)}{T}$$



12.

$L = 1.00 \pm 0.05$ m

$T = 2.00 \pm 0.10$ s

$x \pm \Delta x$, $y \pm \Delta y$

HW:

$$\Delta(x+y) = \sqrt{(\Delta x)^2 + (\Delta y)^2}$$

$$\Delta(xy) = \sqrt{(x\Delta y)^2 + (y\Delta x)^2}$$

$$\Delta(x^a) = |a| x^{a-1} \Delta x$$

$g \pm \Delta g = ?$

$T = 2\pi\sqrt{L/g}$

$g = 4\pi^2 L/T^2$

$g \propto L T^{-2}$

$\Delta(T^{-2})$

$\Delta g = \Delta(L T^{-2})$

$\Delta(T^{-2}) = |-2| T^{-3} \Delta T$

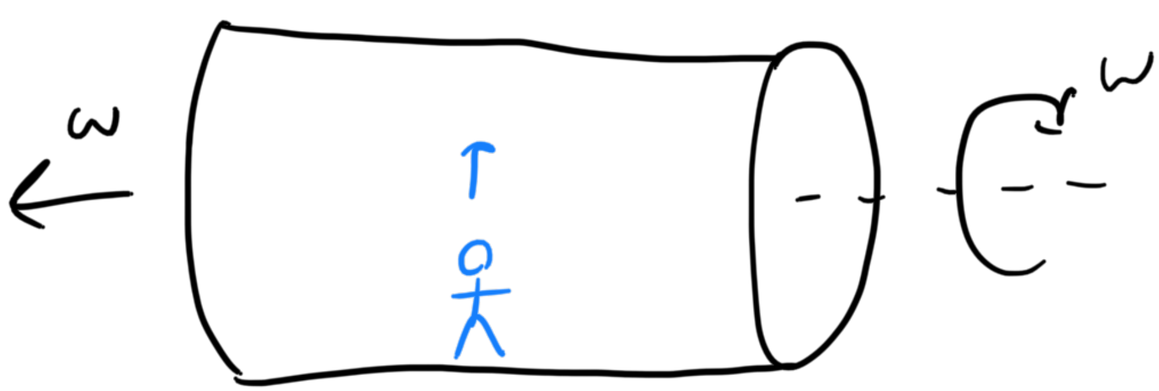
$= 0.025\ s^{-2}$

$\Delta(LT^{-2}) = \sqrt{(L(\Delta T^{-2}))^2 + (T^{-2}\Delta L)^2}$

$= 0.028\ m/s^2$

$\Rightarrow \Delta g = 4\pi(\Delta(LT^{-2})) = 1.1\ m/s^2$.

16.



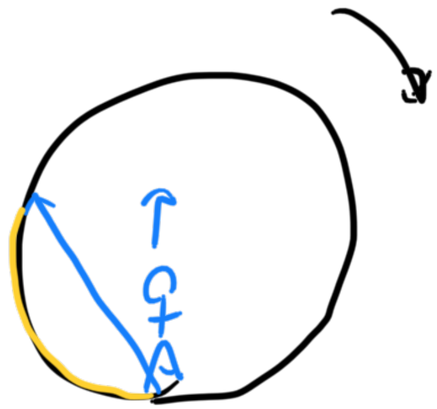
accel. towards floor.

~~D, E~~

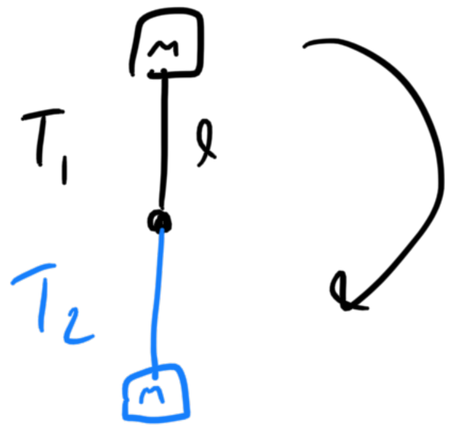
$F_{cor} \propto \vec{v} \times \vec{\omega}$

$= -2m\vec{\omega} \times \vec{v}$

Coriolis: forward



18.



Period T

$$\Delta F_c = m \Delta a_c$$

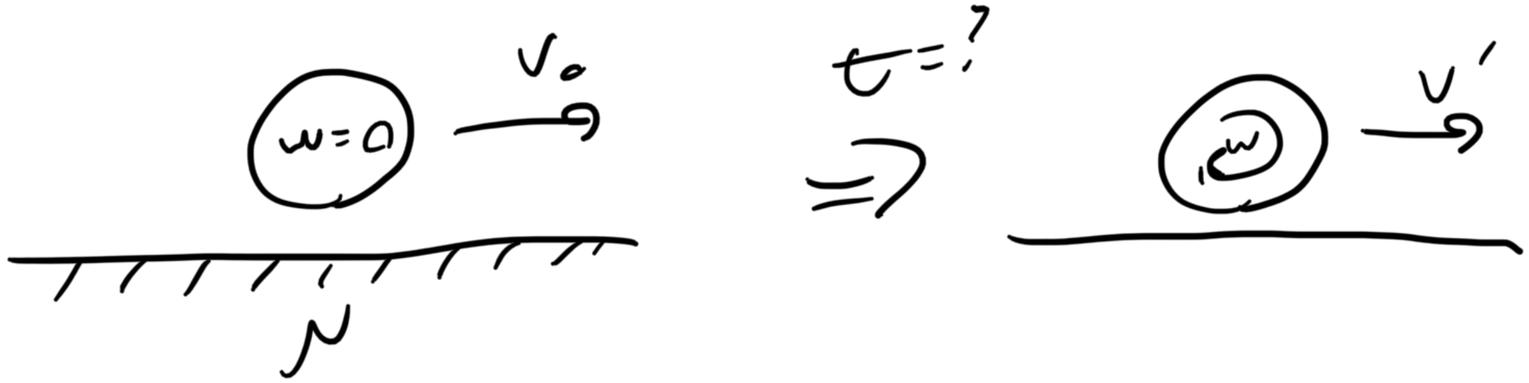
$$= \frac{\Delta(mv^2)}{l}$$

$$= \frac{2\Delta K}{l} = \frac{4mgl}{l} = 4mg$$

$$\Delta F_T = 2mg$$

$$\Delta F = \Delta F_c + \Delta F_T = 6mg$$

21.)



Rolling w/o slipping $\quad w = v/r \quad v = v_0 - Ngt$

$w = \frac{3}{2} Ngt/r$

$F = Nmg = NN$

$I = \frac{2}{3} mr^2 \qquad \tau = I\alpha$

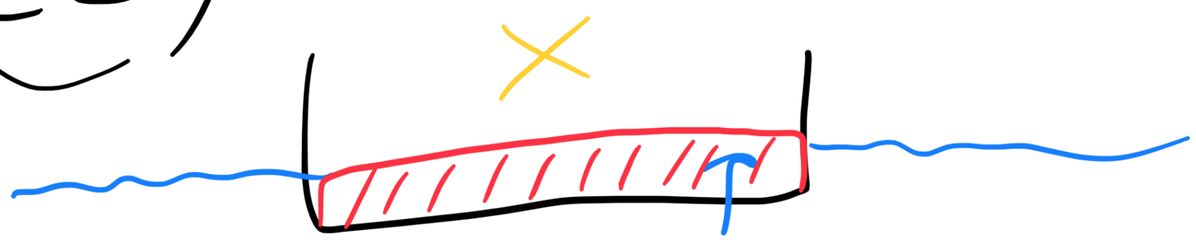
$\Rightarrow \alpha = \frac{3}{2} Ng/r$

$v_0 - Ngt = \frac{3}{2} Ngt$

$t = \frac{2}{5} v_0/Ng$

$\Rightarrow A$

22.



Flow rate?

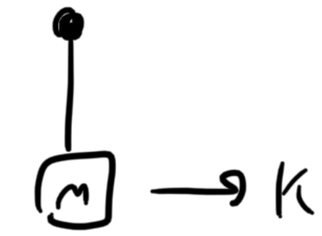
$F_g + F_b$

$F_b \propto \Delta h$

24.

K small, just like a pendulum

as K increases, what happens to T?



Enough energy ⇒