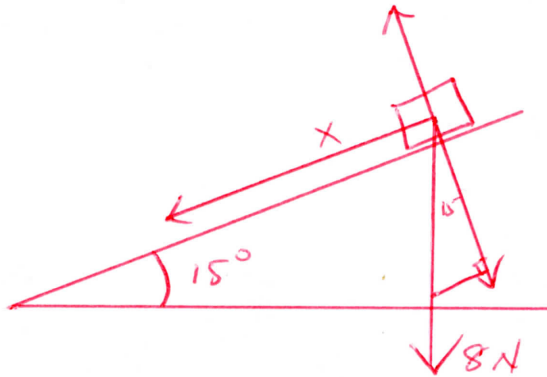


# 11) NEWTON'S THIRD LAW

EQUAL AND OPPOSITE FORCES

---

12)



THE NET FORCE CAUSING ACCELERATION IS  
THE FORCE DOWN THE RAMP

⇒ SOH CAH TOA  
↑ ↘  
 $F_{\text{down ramp}}$   $F_g$

$$\Rightarrow F_g \sin \theta = 8 \text{ N} \sin (15^\circ)$$
$$= 2.07 \text{ N}$$

---

13)  $F_g = 350 \text{ N}$

$m = 70 \text{ kg}$

$g = ?$

$$g = \frac{F_g}{m} = \frac{350 \text{ N}}{70 \text{ kg}}$$

$$= 5 \frac{\text{N}}{\text{kg}}$$

$$14) PE_s = 2.34 \text{ J}$$

$$x = .250 \text{ m}$$

$$k = ?$$

$$\frac{PE_s}{x^2} = \frac{\frac{1}{2} k x^2}{x^2}$$

$$(2) \frac{1}{2} k = \frac{PE_s}{x^2} \quad (2)$$

$$k = \frac{2 PE_s}{x^2} = \frac{2 (2.34 \text{ J})}{(.250 \text{ m})^2}$$

$$74.88 \frac{\cancel{\text{J}}}{\text{m}^2} \text{ N} \cdot \cancel{\text{m}} = \frac{\text{N}}{\text{m}}$$

---

15) LAW OF CONSERVATION OF ENERGY

WE CAN NEITHER CREATE OR DESTROY ENERGY JUST CONVERT FROM ONE TYPE TO ANOTHER

LIGHT  $\rightarrow$  PHOTOCELL  $\rightarrow$  FAN (TURBINE MOTOR)

LIGHT  $\rightarrow$  ELECTRICAL  $\rightarrow$  MECHANICAL

---

16) 1) No  $\Rightarrow$  EM WAVES TRAVEL AT SPEED OF LIGHT MECHANICAL WAVES ARE SLOWER

2) No  $\Rightarrow$  EM WAVES (LIGHT) TRAVEL THROUGH VACUUM

3) No  $\Rightarrow$  MECHANICAL WAVES (SOUND) REQUIRE MEDIUM (SOLID, LIQUID, GAS)

4) YES  $\Rightarrow$  ALL WAVES TRANSFER ENERGY

$$17) 3.9 \times 10^8 \text{ Hz}$$

PRT SEE ELECTROMAGNETIC SPECTRUM AND READ  $10^8 \text{ Hz}$

---

18) ENERGY BASED ON HEIGHT OF WAVES



19) SOUND IS A COMPRESSIONAL LONGITUDINAL WAVE  $\Rightarrow$  EAST & WEST

---

$$20) c = 3 \times 10^8 \text{ m/s}$$

$$f = 5.09 \times 10^{14} \text{ Hz}$$

ETHYL Acetate  $1.36 = n$

$$v = c$$

$$n = \frac{c}{v}$$

$$v = \frac{c}{n} = \frac{3 \times 10^8 \frac{\text{m}}{\text{s}}}{1.36}$$

$$v = 2.205 \times 10^8 \text{ m/s}$$