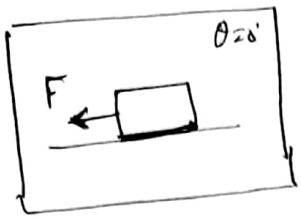
Q1.

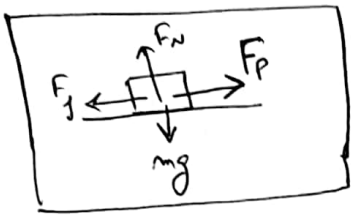


$W = F \cdot d$

$= |F||\Delta x| \cos\theta$

$= 3 \times 2 = 6\,Nm.$

Q2.



F_p = Pushing force

F_f = Friction force

F_N = Normal force.

a) Friction force $= \mu F_N = \mu mg$

$= 0.3 \times 11 \times 10 = 33N$

b) Pushing force

$F_p = F_f = 33N$

c) Work done by Pushing force

$W_p = F_p \cdot d = 33 \times 1.7 = 56.1\,N\text{-}m$

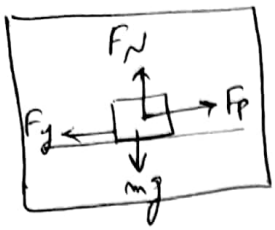
d) Total Work done on the Case of bottled water.

Net force on bottled water = 0

Work done $= 0 \cdot d = 0\,Nm.$

Q3.

Q3.



F_p = Pushing force = 40

F_f = Friction force = μN

F_N = Normal force = mg

a). Work done by Pushing force

$$W_p = F_p \cdot d = 40 \times 1.7 = 68 \text{ Nm.}$$

b) Total Work done

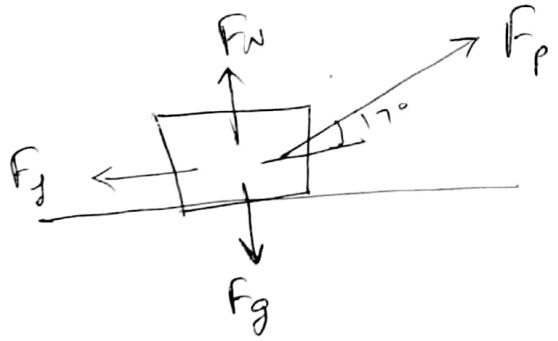
$$\text{Net force} = F_p - F_f = 40 - (\mu mg) = 40 - [0.3 \times 11 \times 10]$$

$$= 40 - 33 = 7 \text{ N}$$

$$\text{Total Work done} = F_{Net} \cdot d = 7 \times 1.7$$

$$= 11.9 \text{ Nm.}$$

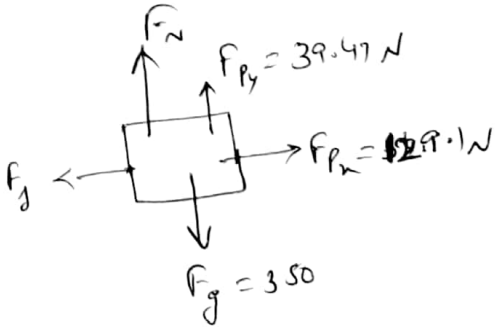
Q4.



$F_g = mg = 35 \times 10 = 350 \text{ N}$

$F_{p_x} = F_p \cos\theta = 135 \cos 17^\circ = 129.10 \text{ N}$

$F_{p_y} = F_p \sin\theta = 135 \sin 17^\circ = 39.47 \text{ N}$



$F_{T_x} = F_{p_x} - F_y$

$= 129.10 - \mu F_N$

In y-direction

$\Sigma F_y = 0 \Rightarrow F_N + F_{p_y} = F_g$

$\Rightarrow F_N = 350 - 39.47 = 310.53N$

In x-direction

$\Sigma F_x = 0$

$\Rightarrow F_{T_x} = F_{p_x} - F_y = F_{p_x} - \mu F_N$

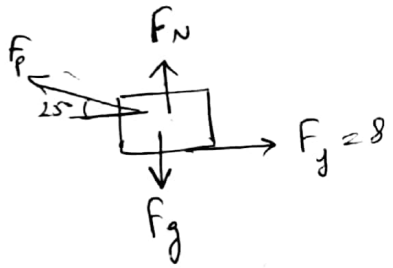
$= 129.10 - (0.14)(310.53)$

$= 129.10 - 43.47 = 85.63N$

Work done $= F_{T_x} \cdot \Delta x$

$= 85.63 \times 8 = 685.05Nm.$

Q5



a) Since Sally Pulls Wagon with Constant velocity.

$\Sigma F_x = 0 \Rightarrow F_p \cos 25^\circ = 8$

$F_p = \frac{8}{\cos 25} = 8.83N$

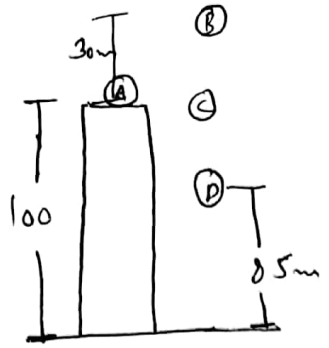
b) Total work done is Zero because Net force is Zero.

c) Work done by Sally on wagon.

$W_S = F_p \cdot \Delta x = F_p \Delta x \cos\theta$

$= 8.83 \cos 25^\circ \times 9 = 72Nm.$

Q6.



Distance between A and D (4)

$= 100 - 85 = 15m.$

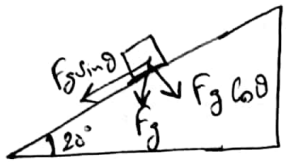
Force of gravity $= mg = 1.2 \times 10$

$= 12 N.$

Work done $= F . \Delta x$ → displacement

$= 12 \times 15 = 180 Nm.$

Q7



a) Work done by gravity on the block.

$W_g = F_g \sin\theta \ \Delta x$

$= mg \sin\theta \ \Delta x$

$= 4 \times 10 \sin 20^\circ \times 5$

$= 68.4 Nm.$

b) Total work done is zero because block is sliding with constant velocity.