

Question 1

Work done (W) = force $\times$ displacement

$$\begin{aligned} & 973.50 \times 43.00 \\ & = \underline{\underline{41860.50 \text{ J}}} \end{aligned}$$

Question 2

$$W = F \cdot s \cos \theta$$

$$= 11,428 \times 376.5 \cos 20^\circ$$

$$= \underline{\underline{4043160.94 \text{ J}}}$$

Question 3

Question 3

force 16.5 lb

6.0 inches

Torque

$$T = fr \Rightarrow 16.5 \times 6 \times 0.083333$$

$$= 16.5 \times 0.5$$

$$= \underline{\underline{8.25 \text{ lb-ft}}}$$

Question 4

161 lb

15 ft high $\rightarrow$ 4.572m

2 blocks per min

$$161 \text{ lb} \rightarrow 20? \quad 716.164 \text{ N}$$

$$(716.164 \times 4.572) \times 20 \times 2$$

$$= \underline{\underline{130972.07232 \text{ J}}}$$

Question 5

170.5 lb ft

40.5 lb

$$= \frac{170.5}{40.5} = 4.21 \text{ ft}$$

Question 6

167.5 kg

pivot 3 m

distance of 71.50

what force?

$$\frac{471.50}{100} \cdot F = 167.5 \times 3 \times 9.8$$

$$F = \frac{167.5 \times 3 \times 9.8}{471.5}$$

$$F = 1044.43 \text{ N}$$

$$= \underline{\underline{1044.43 \text{ N}}}$$

Question 7.

$$\text{Power } P = \frac{\text{workdone}}{\text{Time}}$$

$$P = \frac{mgh}{t} = \frac{963 \times 31}{9}$$

$$= 2247 \text{ W}$$

$$\frac{2247}{1000} = \underline{\underline{2.247 \text{ kW}}}$$

Question 8

11.5m 4.0m
Mechanical advantage?

$$M.A = \frac{\text{Length of the plank}}{\text{Height of the plank}}$$

$$= \frac{11.5}{4}$$

$$= \underline{\underline{2.875}}$$

Question 9

$$= \frac{11.5}{4}$$

$$= \underline{\underline{2.875}}$$

Question 9.

1. Kinetic Energy = $0.5 mv^2$

$$1666.5 = 0.5 \times 0.0335 \times v^2$$

$$v = \sqrt{\frac{1666.5}{0.5 \times 0.0335}}$$

$$= \underline{\underline{315.42 \text{ m/s}}}$$

Question 10

755.5 ft high

Potential energy

$6000,000 \text{ ft}^3$

$$1 \text{ ft}^3 = 62.4 \text{ lb}$$

$$PE = 62.4 \times 10^6 \times 755.5$$

$$= \underline{\underline{4.714 \times 10^{10} \text{ J}}}$$