

CP Jan 3
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Force = weight
 $W = mg = 6\text{ kg} \times 9.8$
 $= 58.8\text{ N}$

$W = F \cdot d$
 $58.8\text{ N} \times .7\text{ m} = \boxed{41.16\text{ Nm}}$

2. $W_{\text{ork}} = 180\text{ J}$
 mass = 4.3 kg
 $d = ?$

$W = Fd$ weight = mg
 $= 4.3\text{ kg}(9.8)$
 $= 42.14\text{ N}$

$180\text{ J} = 42.14\text{ N} \cdot d$

$\frac{180}{42.14} = d = \boxed{4.27\text{ m}}$

3. PE = ?

$PE = mgh$
 $= 9\text{ kg} \left(9.8 \frac{\text{m}}{\text{s}^2}\right) 5\text{ m}$
 $= \boxed{441\text{ J}}$

m 9 kg
 h 5 m

4. $KE = \frac{1}{2} MV^2$
 $= \frac{1}{2} (1300\text{ kg}) \left(\frac{9\text{ m}}{\text{s}}\right)^2$
 $= \frac{1}{2} 1300\text{ kg} \left(\frac{81\text{ m}^2}{\text{s}^2}\right)$
 $= \boxed{52,650\text{ J}}$

5. Bob's bike

$M = 45 \text{ Kg}$

$d = 300 \text{ m}$
 $t = 55 \text{ sec}$
 $KE = \frac{1}{2} m v^2$

$v = \frac{300 \text{ m}}{55 \text{ sec}} = 5.45 \frac{\text{m}}{\text{s}}$

$= \frac{1}{2} (45 \text{ Kg}) \left(5.45 \frac{\text{m}}{\text{s}} \right)^2 = \frac{1}{2} (45) (29.75)$
 $= \frac{669.42 \text{ J}}{668.31}$

6. Motorcycle mass = 300kg
 Force = 500N
 $d = 509 \text{ m}$


$W = F \times d = (500 \text{ N} \times 509 \text{ m})$
 $KE = 254,500 \text{ Nm}$

$KE = \frac{1}{2} m v^2$

$\frac{2 KE}{m} = v^2 = \frac{2 (254500)}{300 \text{ kg}} = v^2$
 $1696.67 \frac{\text{m}^2}{\text{s}^2} = v^2$


$v = 41.19 \frac{\text{m}}{\text{s}}$

7.



$PE = mgh$
 $= 70 \text{ Kg} (9.8) 140 \text{ m}$
 $= 96040 \text{ Nm}$

8.



~~$PE_1 + KE_1 = PE_2 + KE_2$~~

$\frac{1}{2} m v^2 = mgh$
 $\frac{1}{2} 19 \text{ Kg} \left(14 \frac{\text{m}}{\text{s}} \right)^2 = 19 \text{ Kg} \left(9.8 \frac{\text{m}}{\text{s}^2} \right) (h)$
 $1862 \text{ Nm} = 19 (9.8) h$
 $\frac{1862}{(19)(9.8)} = h = 10 \text{ m}$

9. $\frac{3M}{s}$ still
 \equiv $\frac{180 \text{ kg}}{0}$ $\frac{250 \text{ kg}}{0}$

after still $\frac{180 \text{ kg}}{0}$ \equiv $\frac{250 \text{ kg}}{0}$

$$M_1 V_1 + \cancel{M_2 V_1} = \cancel{M_1 V_2} + M_2 V_2$$
$$180 \text{ kg} \left(\frac{3M}{s} \right) = 250 \text{ kg} V_2$$
$$\frac{540}{250} = V = \boxed{2.16 \frac{M}{s}}$$