1-

(c) $12t+13$ 1

2-

(c) 16 1

3-

a) $\frac{3}{2}ma = 34g - mg \rightarrow (1)$ $\frac{1}{2}$

$ma = 32g - mg \rightarrow (2)$ $\frac{1}{2}$

Durch Subtrahieren (1) von (2)

$\frac{1}{2}ma = 2g \Rightarrow ma = 4g \rightarrow (3)$

von (3) in (2)

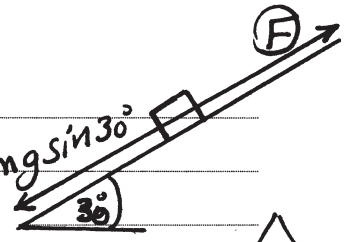
$\therefore 4g = 32g - mg$ $\frac{1}{2}$

$mg = 28g \Rightarrow m = 28\ kg.$ $\frac{1}{2}$

Durch Ersetzen in (3) $\Rightarrow 28a = 4g$ $\frac{1}{2}$

$\therefore a = \frac{4g}{28} = \frac{4 \times 9.8}{28} = 1.4\ m/sec^2$ $\frac{1}{2}$

b] $F = \frac{1}{2} \times 9.8 = 4.9$



$mg \sin 30 = \frac{1}{2} \times 9.8 \times \sin 30^\circ$

$= 2.45$

$\therefore F > mg \sin 30^\circ$ ½

Die Bewegung ist nach oben auf der Ebene.

$\therefore ma = F - mg \sin 30^\circ$ ½

$\frac{1}{2} a = 4.9 - 2.45$

$\therefore a = 4.9 \ m/sec^2$ ½

Nach 2 sec.

$V = U + at = 0 + 4.9 \times 2 = 9.8 \ m/sec.$ ½

Bei der Verschwindung der Kräfte

$a' = -g \sin 30^\circ = -9.8 \times \frac{1}{2}$

$\therefore a' = -4.9 \ m/sec^2$ ½

$\therefore V^2 = U^2 + 2a'S$

$= (9.8)^2 - 2 \times 4.9 \ S$

$S = 9.8$ Meter ½

(تراعى الحلول الأخرى)

4-

(b) 20 (1)

5-

(b) 168750 (1)

6-

(a) $P_A = mg \times 10$

$P_A = 0.3 \times 9.8 \times 10 = 29.4$ Joule (1/2)

$T_A = 0 \quad \therefore P_B = 0.3 \times 9.8 \times 3 = 8.82$ Joule (1)

$\therefore T_A + P_A = T_B + P_B$ (1/2)

$0 + 29.4 = T_B + 8.82$

$T_B = 29.4 - 8.82 = 20.58$ Joule (1)

b $\because m(\angle AMC) = 120^\circ$

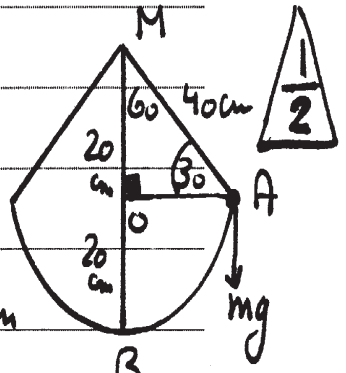
$\therefore m(\angle AMO) = 60^\circ$ ½

In $\triangle AOM$

$\because OM = 20cm \quad \therefore BO = 20cm$ ½

(i) $P_A - P_B = mg \times 20$ ½

$= 8 \times 980 \times 20 = 156800$ Erg ½



(ii) $\because T_B + P_B = T_A + P_A$ ½

$\therefore \frac{1}{2} m v^2 + 0 = 0 + 156800$

$4v^2 = 156800$

$v^2 = 39200$

$v \simeq 198$ cm/sec. ½

(تراعى الحلول الأخرى)

7-

(a) 32 ١

8-

(b) 72 ١

9-

$\because V = \frac{dx}{dt}$

$\therefore x = \int_0^3 v\,dt = \int_0^3 (3t^2 - 2t)\,dt$ ½

$\therefore x = [t^3 - t^2]_0^3 = 27 - 9 = 18$ Meter ½

d.h, dass das Auto 18 m rechts vom Ausgangspunkt entfernt ist.

$\therefore a = \frac{dv}{dt} = 6t - 2$ ½

Bei $t = 3$ sec. $\therefore a = 6 \times 3 - 2 = 16\ m/sec^2$ ½

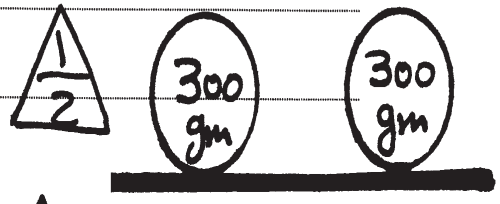
10-

$\therefore m_1 v_1 + m_2 v_2 = m_1 v_1' + m_2 v_2'$ (1/2)

$\therefore 300 \times 5 + 300 \times 9 = 300 \times 8 + 300\, v_2'$ (1/2)

$5 + 9 = 8 + v_2'$

$\therefore v_2' = 6$ m/sec.



In dieselbe Richtung ihrer Bewegung (1/2)

$v_2 = 9$ m/sec. $v_1 = 5$ m/sec

$v_1' = 8$ m/sec

$I = m_1 (v_1' - v_1)$ (1/2)

$I = 300 (8 - 5)$

$I = 900$ gm.cm.sec (1/2)

(تراعى الحلول الأخرى)

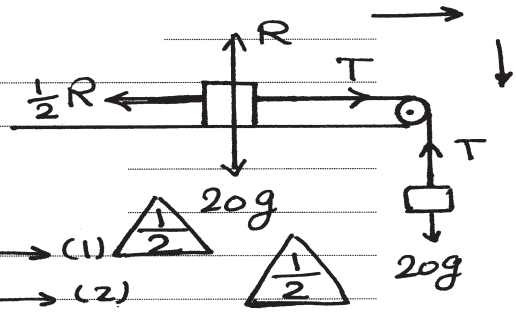
11-

(d) $t - \cos t - 2$ (1)

12-

(c) 129.8 (1)

13-



$R = 20g$

Die Gleichungen der Bewegung

$20a = 20g - T \longrightarrow (1)$ (½)

$20a = T - \frac{1}{2}R \longrightarrow (2)$ (½)

Durch Addieren

$40a = 20g - \frac{1}{2} \times 20g$

$40a = 10g$

$a = \frac{1}{4}g = 245\ cm/sec^2$ (½)

Durch Ersetzen in (1)

(1)

$T = 20g - 20a$

$T = 20(980 - 245) = 14700$ Dyn (½)

$\therefore P = \sqrt{2}T = 14700\sqrt{2}$ Dyn (½)

$V^2 = U^2 + 2as$

$V^2 = 0 + 2 \times 245 \times 250$

$V = 350\ cm/sec.$

Die Geschwindigkeit der Kollision (½)

der aufgehängten Masse gegen den Boden $= 350\ cm/sec$

14-

$$\vec{r} = (3t^2+2)\vec{i} + (4t^2+3)\vec{j}$$

$$\vec{r}_0 = 2\vec{i} + 3\vec{j}$$

$$\vec{s} = \vec{r} - \vec{r}_0$$

$$\therefore \vec{s} = 3t^2\vec{i} + 4t^2\vec{j}$$

$$\vec{v} = \frac{d\vec{s}}{dt} = 6t\vec{i} + 8t\vec{j}$$

$$\vec{a} = \frac{d\vec{v}}{dt} = 6\vec{i} + 8\vec{j}$$ $\frac{1}{2}$

$$\vec{F} = m\vec{a} = 3(6\vec{i} + 8\vec{j})$$

$$\vec{F} = 18\vec{i} + 24\vec{j}$$ F ist eine konstante Kraft. $\frac{1}{2}$

$$\therefore W = \vec{F} \cdot \vec{s}$$

$$= (18,24) \cdot (3t^2, 4t^2)$$

$$= 150\,t^2$$ $\frac{1}{2}$

Die durch diese Kraft verrichtete Arbeit von

$t = 1$ auf $t = 5$

$$W = [150\,t^2]_1^5$$

$$= 150(5)^2 - 150(1)^2 = 3600$$ Arbeitseinheit $\frac{1}{2}$

(تراعى الحلول الأخرى)

15-

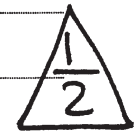
(c) 3.5 

16-

(b) 9 

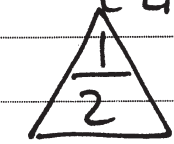
17-

(a) Die Gleichung von $\overrightarrow{OA}$ lautet

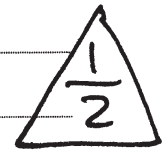
$$\frac{F-0}{n-0} = \frac{5-0}{2-0} \Rightarrow F = \frac{5}{2}t$$ 

Der Impuls während der ersten Sekunde

$$I = \int_0^1 F\,dt = \int_0^1 \frac{5}{2}t\,.dt = \left[\frac{5t^2}{4}\right]_0^1$$

$$I = \frac{5}{4} \text{ Newton. .sec.}$$ 

(b) Der Impuls während des Zeitintervalls $[0,6]$

$$I = \int_0^2 \frac{5}{2}t\,dt + \int_2^6 5\,dt$$ 

$$= \left[\frac{5t^2}{4}\right]_0^2 + [5t]_2^6 = 5 + (30-10)$$

$$= 25 \text{ Newton..sec.}$$ 

18-

Angenommen, dass die Anzahl der Kasten = y

$W = 30y \times 9.8 \times 0.9$ (1/2)

Die durchschnittliche Leistung = $\frac{\text{die Arbeit}}{\text{die Zeit}}$ (1/2)

$30y \times 9.8 \times 0.9 = 0.3 \times 75 \times 9.8 \times 60$ (1/2)

$y = 50$ (1/2)

Die Anzahl der Kästen ist 50 Kästen.

(تراعى الحلول الأخرى)

(انتهت الإجابة وتراعى الحلول الأخرى)