2019

: 4 6 24

6 3 0

	1	2	3	4
	CD	**AD**	**D**	**C**

: 4 6 24

5. $3\sqrt{3}$m/s 60° 6. 20 N 0°

7. $\frac{24p_0}{7}$ $\frac{96p_0}{35}$ + $\frac{3g}{5}$ 8. 0.625W

6 102

9 15

1

$\frac{n_1}{h} + \frac{n_0}{v} = \frac{n_0-n_1}{}$ **3**

$n_0 = 1$

$v = -\frac{3h}{4}$ **2**

$\frac{3h}{4}$

2

$\frac{n_1}{h} + \frac{n_2}{v_1} = \frac{n_2-n_1}{-R}$ **3**

$R = 2h$

$\frac{n_2}{u_2} + \frac{n_0}{v_2} = \frac{n_0-n_2}{}$ **3**

$u_2 = -v_1$

$v_2 = -\frac{12h}{17}$ **2**

$v = v - v_2 = \frac{3h}{68}$ **2**

10. 15

1 Q

$Q = \frac{R}{d}Q$ **2**

$x = \frac{R^2}{d}$ **2**

$Q = \frac{R}{d}Q$ **1**

q $q = q$ $q = q$ q

O q Q $q + Q$ Q Q

$F = k\frac{QQ}{(d \quad x)^2} \quad k\frac{Q(q + Q)}{d^2}$ **3**

Q q Q x

$F = k\frac{RdQ^2}{(d^2 \quad R^2)^2} \quad k\frac{Q(qd+QR)}{d^3}$ **2**

2 Q Q O $q + Q$

q

$U = k\frac{(q + Q)}{R} + k\frac{q}{R} = k\frac{Q}{R} = k\frac{Q}{d}$ **3**

q

$W = Uq = k\frac{Qq}{d}$ **2**

11. 18

1 $\frac{V_1}{T_1} = \frac{V_2}{T_2}$ **2**

$T_2 = \frac{V_2}{V_1}T_1 = 900\text{K}$ **2**

$T_2V_2^{\ -1} = T_3V_3^{\ -1}$ **2**

$T_3 = T_1 = 300\text{K}$

$= \frac{C_P}{C_V} = \frac{\frac{5R}{2}}{\frac{3R}{2}} = \frac{5}{3}$

$V_3 = V_2(\frac{T_2}{T_3})^{1/(\ -1)} = 31.2\text{L}$ **2**

2

$p_1 = \frac{1}{V_1} = 2.49\times10^5\text{Pa}$ **2**

$W_1 = p_1(V_2 \quad V_1) = 9.96\times10^2\text{J}$ **2**

$\text{E}_1 = \quad C_\text{V}(T_2 \quad T_1) = 1.50\times10^3\text{J}$ **2**

$Q \quad = W_1 + \quad E_1 = 2.50\times10^3\text{J}$ **2**

$E \quad = 0$

$W \quad = Q \quad = 2.50\times10^3\text{J}$ ⑪ **2**

12 18

1 $N_1 \quad N_2$

$N_1 + N_2 \quad = ma_1$ **2**

$N_1 + N_2 = mg$ **2**

s_1

$v^2 = 2a_1 s_1$ **2**

$s_1 = \frac{v^2}{2\ g}$ **2**

$N_1 + N_2 \quad y - N_1 x_1 + N_2 x_2 = 0$ **2**

N

$v_0=\sqrt{\frac{gh}{2}}$ $B=\frac{m}{q}\sqrt{\frac{2g}{h}}$ **2**

$=\frac{v_0}{R}=\sqrt{\frac{2g}{h}}$ **2**

$x=v_0t-R\sin$ $y=-R(1-\cos\ )$ **2**

v_0 R

$x=\sqrt{\frac{gh}{2}}t-\frac{h}{2}\sin\sqrt{\frac{2g}{h}}t$ $y=-\frac{h}{2}(1-\cos\sqrt{\frac{2g}{h}}t)$ **2**

2 v_0 v_0

$v=2v_0=\sqrt{2gh}$ **2**

qBv

$qBv\quad mg=\frac{mv^2}{}$ **2**

$=2h$ **1**

14 18

(1) v x t

$x=v\cos\ t$ **1**

$v\sin\ =g\frac{t}{2}$ **1**

$x=\frac{v^2\sin2}{g}$ $=45°$ **1**

$x=L$ $v=\sqrt{gL}$ **1**

$y=\frac{v^2}{2g}=\frac{L}{2}$ **1**

(2) v_1 v_2 t s

$\frac{1}{2}mv^2=\frac{1}{2}mv_1^2+\frac{1}{2}Mv_2^2$ **1**

$mv_1\cos\ =Mv_2$ **1**

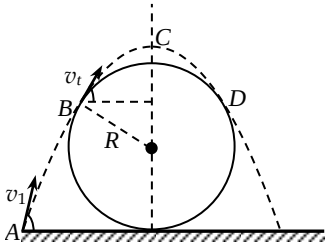
$v_1\sin\ =g\frac{t}{2}$ **1**

$s=(v_1\cos\ +v_2)\,t$ **1**

$$s=\frac{2m+2M}{m+2M}L$$ **1**

(3) B D v_t

,



$\frac{1}{2}mv^2=\frac{1}{2}mv_3^2+\frac{1}{2}Mv_4^2$ ⑪ **1**

$mv_3\cos\ =Mv_4$ ⑫ **1**

A B ,

$\frac{1}{2}mv_3^2=\frac{1}{2}mv_t^2+mgR\ (1+\cos\ )$ ⑬ **1**

$(v_3\sin\ )^2-(v_t\sin\ )^2=2gR\ (1+\cos\ )$ ⑭ **1**

B C , $v_t\sin\ =gt$ ⑮ **1**

$v_t t\ \cos\ =R\sin$ ⑯ **1**

⑪⑫⑬⑭ $R=\dfrac{ML}{2[(1+\cos\ +\dfrac{1}{2\cos})(M+m(\cos\dfrac{3}{8})^2)]}$ ⑯ **1**

$=45°$ $R=\dfrac{ML}{2[(1+\sqrt{2})(M+m(\cos\dfrac{3}{8})^2)]}$ ⑯ **1**