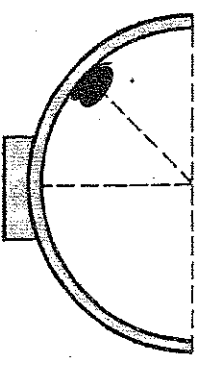


國立武陵高中 98 學年度第一學期第二次期中考高二物理科試題

一、單選題：每題 4 分，共 80 分（若因題意計算之需要， $g = 10 \text{ m/s}^2$ ），請將適當答案劃記於答案卡上相應之位置。

1. 一小蟲沿半徑為 R 之半球形碗壁上爬，若此蟲最多可爬昇至距碗底鉛直高度 $\frac{R}{2}$ 處，則蟲與碗壁間之靜摩擦係數為若干？

(A) $\frac{\sqrt{3}-1}{2}$ (B) $\sqrt{3}$ (C) $\frac{3}{4}$ (D) $\frac{1}{\sqrt{3}}$ (E) 1

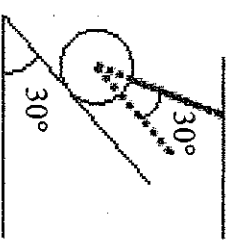


2. 一物由粗糙斜面下端以一初速上滑，發現此物可達最高點後又下滑回到出發處。已知上滑時間與下滑時間比為 $1:\sqrt{3}$ ，且斜面與水平方向夾角 θ 滿足 $\cos \theta = \frac{1}{\sqrt{5}}$ ，求此斜面之動摩擦係數為何？

(A) 2 (B) $\frac{3}{4}$ (C) $\frac{4}{3}$ (D) 1 (E) $\sqrt{3}$

3. 如右圖，均勻球質量為 1 kg ，置於仰角 30° 之斜面上，斜面與圓球間之靜摩擦係數為 0.25 ，今以細繩繫於球上，繩與斜面間夾角為 30° 且細繩延長線過球心，求細繩上張力大小

(A) $\frac{1}{\sqrt{3}}$ (B) $\frac{10}{\sqrt{3}}$ (C) $\frac{\sqrt{3}}{8}$ (D) $\frac{5\sqrt{3}}{4}$ (E) $\frac{\sqrt{3}}{4} \text{ kgw}$



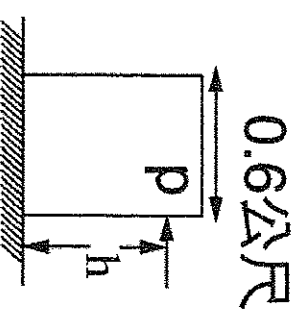
4~5. 為題組

4. 如右圖，一均勻木箱置於地面上，木箱重 60 kg ，寬 0.6 公尺，高度未知。已知今於木箱側邊上 P 點施一水平向左之推力，恰可使木箱在向左移動，同時發生翻倒的現象，且平面與木箱間之靜摩擦係數為 $\frac{1}{3}$ ，則此水平推力大小為多少牛頓

(A) 360 (B) 180 (C) 600 (D) 200 (E) 60 N

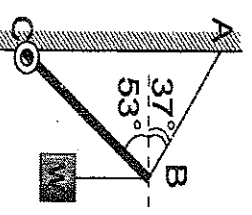
5. 圖中 P 點離地高度 h 為何？

(A) 1.5 (B) 0.9 (C) 0.6 (D) 2 (E) 2.5 公尺



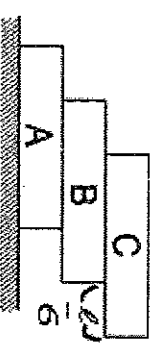
6. 如圖，一均勻細桿 BC 重 100 N 以繩 AB 繫住，且桿上 C 點以樞紐連接在牆上，使桿可繞樞紐無摩擦地轉動，若 AB 繩可負擔之最大張力為 300 N ，則圖中裝置可負擔之重量 W 最大為若干？

(A) 150 (B) 200 (C) 300 (D) 400 (E) 450 N



7. 如右圖，三均勻木塊 A 、 B 、 C 長度皆為 ℓ ，質量依序為 m 、 $2m$ 、 $3m$ ，已知 C 木塊較 B 木塊向右突出 $\frac{\ell}{6}$ ，則 B 木塊相對於 A 木塊最多可突出多少？

(A) $\frac{5}{12}\ell$ (B) $\frac{2}{3}\ell$ (C) $\frac{3}{4}\ell$ (D) $\frac{5}{9}\ell$ (E) $\frac{2}{5}\ell$



8. 一半徑 R 的圓球，挖去半徑 $\frac{R}{2}$ 的內切圓球，將挖下的圓球置於原球正上方，如右圖，此系統的質心距原圓心多遠？

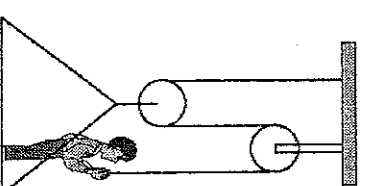
(A) $\frac{R}{6}$ (B) $\frac{R}{14}$ (C) $\frac{\sqrt{10}}{8}R$ (D) $\frac{\sqrt{10}R}{10}$ (E) $\frac{\sqrt{10}R}{16}$



背面有題

9.~10. 為題組

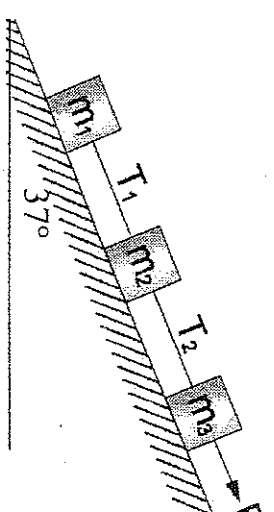
9. 人與平台及兩個滑輪裝置如右圖，人重 60kg，平台重 15kg，兩滑輪各重 15kg，不計任何摩擦力，則此人需施力多少牛頓才能使人與平台系統一併以 2 m/s^2 之加速度上升？ (A)300 (B)420 (C)360 (D)250 (E)350 N



10. 承上，此時人與平台間作用力多少牛頓？ (A)300 (B)420 (C)360 (D)250 (E)350 N

11.~12. 為題組

11. 如右圖所示，將質量分別為 $m_1=30$ 公斤、 $m_2=20$ 公斤及 $m_3=10$ 公斤的三個物體，用細繩相連成串並置於仰角 37° 之斜面上，斜面與各物體間之靜摩擦係數為 0.3、動摩擦係數皆為 0.25。若施一平行斜面向上 60 牛頓之拉力 F ，則繩的張力的量值 T_1 、 T_2 各是多少牛頓？



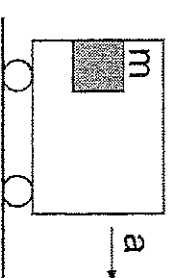
- (A) $T_1=36\text{ N}$, $T_2=0\text{ N}$ (B) $T_1=156\text{ N}$, $T_2=108\text{ N}$
(C) $T_1=108\text{ N}$, $T_2=60\text{ N}$ (D) $T_1=210\text{ N}$, $T_2=110\text{ N}$
(E) $T_1=30\text{ N}$, $T_2=50\text{ N}$

12. 承上，此時系統之加速度大小為何？

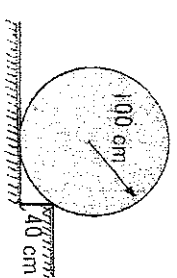
- (A)1 (B)2 (C)3 (D)5 (E)0 m/s^2

13. 如右圖所示，在車廂左側的鉛直內壁上靠著一個質量為 m 的物體，與車壁間的靜摩擦係數為 μ ，欲使 m 不至於掉下來，車廂應具有向右的加速度最小值為

- (A) $g\mu$ (B) g (C) $\frac{g}{\mu}$ (D) $\frac{m}{\mu}$ (E) $\frac{\mu}{g}$



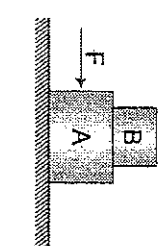
14. 重量 100 kgw 之金屬球，半徑為 100 cm 欲使其滾上高度 40 cm 的階梯，如右圖所示。試問最小水平施力為多少 kgw？



- (A)30 (B)40 (C)50 (D)60 (E) $\frac{400}{3}$ kgw

15.~16. 為題組

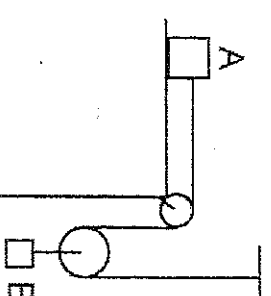
15. 右圖中 A 的質量為 $m_A=2.0\text{ kg}$ ，B 的質量為 $m_B=1.0\text{ kg}$ ，若施一向右的水平力 $F=12\text{ N}$ 於 A，發現 B 會與 A 以速度 4.0 m/s 一起向右等速前進而無相對滑動，已知兩物體間動摩擦係數為 0.15 此時 B 作用於 A 之摩擦力大小為



- (A)0 (B)2 (C)4 (D)8 (E)1.5 N

16. 承上，若以 18N 之向右水平推力作用於 A，發現 B 恰好開始與 A 相對滑動，則 A 與 B 之靜摩擦係數為何？ (A)0.4 (B)0.3 (C)0.25 (D)0.2 (E)0.15

17. 滑輪組與兩物體 A、B 組合如右圖所示，A 的質量為 $m_A=1\text{ kg}$ ，B 的質量為 $m_B=2\text{ kg}$ ，物體 A 連接一細繩跨過定滑輪與動滑輪接於天花板，物體 B 直接以另一細繩接於動滑輪上。不計繩、滑輪的質量與一切阻力，求物體 B 之加速度大小

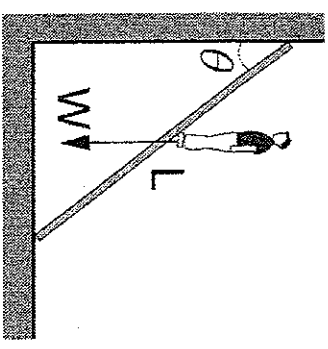


- (A) $\frac{g}{2}$ (B) $\frac{g}{3}$ (C) $\frac{2g}{3}$ (D) $\frac{3g}{4}$ (E) $\frac{g}{5}$ m/s^2

18.~19. 為題組

18. 若一梯子長 L ，重可不計，靠牆與地上，如右圖，牆面光滑。一個重 W 的人立於梯的中間，梯與牆夾角 θ ，已知 $\tan \theta = 3$ ，則此時地面與梯間之摩擦力為何？

(A) $\frac{1}{2}W$ (B) $\frac{3}{2}W$ (C) $\frac{1}{3}W$ (D) $3W$ (E) W

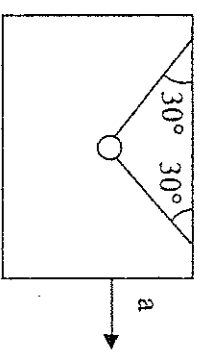


19. 若此人繼續爬上梯子，至與梯底距 $\frac{2}{3}L$ 處時梯子恰要下滑，則梯與地面間的靜摩擦係數為何？

(A) 1 (B) 2 (C) 3 (D) $\frac{2}{3}$ (E) $\frac{1}{3}$

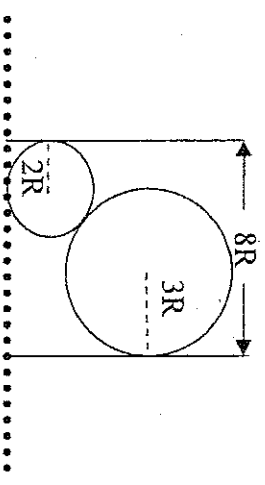
20. 一球質量 m ，如圖所示以兩繩懸掛於車內，當車向右以一等加速度 a 運動時，左右兩繩上的張力 $T_{\text{左}} : T_{\text{右}} = 2 : 3$ ，則 a 應為

(A) $\frac{g}{5\sqrt{3}}$ (B) $\frac{g}{2\sqrt{3}}$ (C) $\frac{g}{3\sqrt{3}}$ (D) $\frac{2g}{3\sqrt{3}}$ (E) $\frac{g}{\sqrt{3}}$



二、計算題：每題 10 分，共 20 分（若因題意計算之需要， $g = 10 \text{ m/s}^2$ ），未詳列算式或適當敘述理由者不予計分。

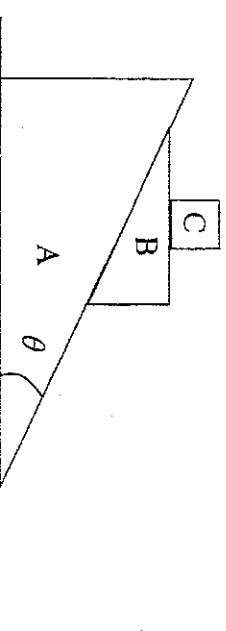
1. 一無頂蓋亦無底面之光滑圓筒直立於地面（以虛線表示）上，圓筒直徑 $8R$ ，重量 $3W$ ，今在其中置入兩半徑分別為 $2R$ 、 $3R$ 的均勻光滑圓球如圖所示。則：
- (a) 若大球重量 $3W$ ，則圓筒與大球間之正向力為多少 W ？(4%)
- (b) 設大球重量大小可任意調整，則其過重時圓筒會向哪一方向傾倒？(1%)
- (c) 承上，當大球重量為何時，圓筒恰將傾倒？(1%)



2. 兩楔形木塊 A、B 與一矩形木塊 C 相疊如圖，三者質量相等為 W ，置於地面上。A、B 間為光滑，B、C 間以及 A 與地面間有若干摩擦力。當 B 與 C 由 A 上滑下時，兩者間無相對滑動，且 A 亦相對地面靜止，已知斜面仰角 θ ，求：

(a) B、C 間靜摩擦力大小為何？(5%)

(b) A 所受地面給予之摩擦力大小為何？(5%)

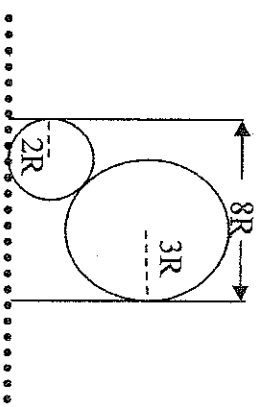


武陵高中 98 學年度第一學期第二次期中考高二物理科計算題作答區

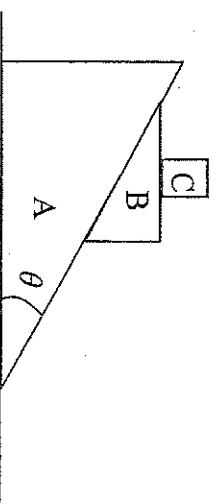
班級： 座號： 姓名：

二、計算題：每題 10 分，共 20 分，未詳列算式或適當敘述理由者不予計分。

1.



2.



平陽縣志







高二物理期中考

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： 劉記所製：

1. 請用 2B 鉛筆題記。
2. 畫線要粗黑，看物，不可出格，擦試要清潔，若畫線過輕或污損不清，不為機器所接受，考生自行負責。
3. 劃卡範例：正確  不正確   

10 缺考記錄(本欄由監試人員劃記,考生勿自行劃記)

↓ 注意讀號，不要漏錯

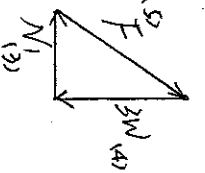
1	A	B	C	D	E	26	A	B	C	D	E	31	A	B	C	D	E	36	A	B	C	D	E	41	A	B	C	D	E	46	A	B	C	D	E	51	A	B	C	D	E	56	A	B	C	D	E	61	A	B	C	D	E	66	A	B	C	D	E	71	A	B	C	D	E	76	A	B	C	D	E	81	A	B	C	D	E	86	A	B	C	D	E	91	A	B	C	D	E	96	A	B	C	D	E	101	A	B	C	D	E	106	A	B	C	D	E	111	A	B	C	D	E	116	A	B	C	D	E	121	A	B	C	D	E	126	A	B	C	D	E	131	A	B	C	D	E	136	A	B	C	D	E	141	A	B	C	D	E	146	A	B	C	D	E	151	A	B	C	D	E	156	A	B	C	D	E	161	A	B	C	D	E	166	A	B	C	D	E	171	A	B	C	D	E	176	A	B	C	D	E	181	A	B	C	D	E	186	A	B	C	D	E	191	A	B	C	D	E	196	A	B	C	D	E	201	A	B	C	D	E	206	A	B	C	D	E	211	A	B	C	D	E	216	A	B	C	D	E	221	A	B	C	D	E	226	A	B	C	D	E	231	A	B	C	D	E	236	A	B	C	D	E	241	A	B	C	D	E	246	A	B	C	D	E	251	A	B	C	D	E	256	A	B	C	D	E	261	A	B	C	D	E	266	A	B	C	D	E	271	A	B	C	D	E	276	A	B	C	D	E	281	A	B	C	D	E	286	A	B	C	D	E	291	A	B	C	D	E	296	A	B	C	D	E	301	A	B	C	D	E	306	A	B	C	D	E	311	A	B	C	D	E	316	A	B	C	D	E	321	A	B	C	D	E	326	A	B	C	D	E	331	A	B	C	D	E	336	A	B	C	D	E	341	A	B	C	D	E	346	A	B	C	D	E	351	A	B	C	D	E	356	A	B	C	D	E	361	A	B	C	D	E	366	A	B	C	D	E	371	A	B	C	D	E	376	A	B	C	D	E	381	A	B	C	D	E	386	A	B	C	D	E	391	A	B	C	D	E	396	A	B	C	D	E	401	A	B	C	D	E	406	A	B	C	D	E	411	A	B	C	D	E	416	A	B	C	D	E	421	A	B	C	D	E	426	A	B	C	D	E	431	A	B	C	D	E	436	A	B	C	D	E	441	A	B	C	D	E	446	A	B	C	D	E	451	A	B	C	D	E	456	A	B	C	D	E	461	A	B	C	D	E	466	A	B	C	D	E	471	A	B	C	D	E	476	A	B	C	D	E	481	A	B	C	D	E	486	A	B	C	D	E	491	A	B	C	D	E	496	A	B	C	D	E	501	A	B	C	D	E	506	A	B	C	D	E	511	A	B	C	D	E	516	A	B	C	D	E	521	A	B	C	D	E	526	A	B	C	D	E	531	A	B	C	D	E	536	A	B	C	D	E	541	A	B	C	D	E	546	A	B	C	D	E	551	A	B	C	D	E	556	A	B	C	D	E	561	A	B	C	D	E	566	A	B	C	D	E	571	A	B	C	D	E	576	A	B	C	D	E	581	A	B	C	D	E	586	A	B	C	D	E	591	A	B	C	D	E	596	A	B	C	D	E	601	A	B	C	D	E	606	A	B	C	D	E	611	A	B	C	D	E	616	A	B	C	D	E	621	A	B	C	D	E	626	A	B	C	D	E	631	A	B	C	D	E	636	A	B	C	D	E	641	A	B	C	D	E	646	A	B	C	D	E	651	A	B	C	D	E	656	A	B	C	D	E	661	A	B	C	D	E	666	A	B	C	D	E	671	A	B	C	D	E	676	A	B	C	D	E	681	A	B	C	D	E	686	A	B	C	D	E	691	A	B	C	D	E	696	A	B	C	D	E	701	A	B	C	D	E	706	A	B	C	D	E	711	A	B	C	D	E	716	A	B	C	D	E	721	A	B	C	D	E	726	A	B	C	D	E	731	A	B	C	D	E	736	A	B	C	D	E	741	A	B	C	D	E	746	A	B	C	D	E	751	A	B	C	D	E	756	A	B	C	D	E	761	A	B	C	D	E	766	A	B	C	D	E	771	A	B	C	D	E	776	A	B	C	D	E	781	A	B	C	D	E	786	A	B	C	D	E	791	A	B	C	D	E	796	A	B	C	D	E	801	A	B	C	D	E	806	A	B	C	D	E	811	A	B	C	D	E	816	A	B	C	D	E	821	A	B	C	D	E	826	A	B	C	D	E	831	A	B	C	D	E	836	A	B	C	D	E	841	A	B	C	D	E	846	A	B	C	D	E	851	A	B	C	D	E	856	A	B	C	D	E	861	A	B	C	D	E	866	A	B	C	D	E	871	A	B	C	D	E	876	A	B	C	D	E	881	A	B	C	D	E	886	A	B	C	D	E	891	A	B	C	D	E	896	A	B	C	D	E	901	A	B	C	D	E	906	A	B	C	D	E	911	A	B	C	D	E	916	A	B	C	D	E	921	A	B	C	D	E	926	A	B	C	D	E	931	A	B	C	D	E	936	A	B	C	D	E	941	A	B	C	D	E	946	A	B	C	D	E	951	A	B	C	D	E	956	A	B	C	D	E	961	A	B	C	D	E	966	A	B	C	D	E	971	A	B	C	D	E	976	A	B	C	D	E	981	A	B	C	D	E	986	A	B	C	D	E	991	A	B	C	D	E	996	A	B	C	D	E	1001	A	B	C	D	E	1006	A	B	C	D	E	1011	A	B	C	D	E	1016	A	B	C	D	E	1021	A	B	C	D	E	1026	A	B	C	D	E	1031	A	B	C	D	E	1036	A	B	C	D	E	1041	A	B	C	D	E	1046	A	B	C	D	E	1051	A	B	C	D	E	1056	A	B	C	D	E	1061	A	B	C	D	E	1066	A	B	C	D	E	1071	A	B	C	D	E	1076	A	B	C	D	E	1081	A	B	C	D	E	1086	A	B	C	D	E	1091	A	B	C	D	E	1096	A	B	C	D	E	1101	A	B	C	D	E	1106	A	B	C	D	E	1111	A	B	C	D	E	1116	A	B	C	D	E	1121	A	B	C	D	E	1126	A	B	C	D	E	1131	A	B	C	D	E	1136	A	B	C	D	E	1141	A	B	C	D	E	1146	A	B	C	D	E	1151	A	B	C	D	E	1156	A	B	C	D	E	1161	A	B	C	D	E	1166	A	B	C	D	E	1171	A	B	C	D	E	1176	A	B	C	D	E	1181	A	B	C	D	E	1186	A	B	C	D	E	1191	A	B	C	D	E	1196	A	B	C	D	E	1201	A	B	C	D	E	1206	A	B	C	D	E	1211	A	B	C	D	E	1216	A	B	C	D	E	1221	A	B	C	D	E	1226	A	B	C	D	E	1231	A	B	C	D	E	1236	A	B	C	D	E	1241	A	B	C	D	E	1246	A	B	C	D	E	1251	A	B	C	D	E	1256	A	B	C	D	E	1261	A	B	C	D	E	1266	A	B	C	D	E	1271	A	B	C	D	E	1276	A	B	C	D	E	1281	A	B	C	D	E	1286	A	B	C	D	E	1291	A	B	C	D	E	1296	A	B	C	D	E	1301	A	B	C	D	E	1306	A	B	C	D	E	1311	A	B	C	D	E	1316	A	B	C	D	E	1321	A	B	C	D	E	1326	A	B	C	D	E	1331	A	B	C	D	E	1336	A	B	C	D	E	1341	A	B	C	D	E	1346	A	B	C	D	E	1351	A	B	C	D	E	1356	A	B	C	D	E	1361	A	B	C	D	E	1366	A	B	C	D	E	1371	A	B	C	D	E	1376	A	B	C	D	E	1381	A	B	C	D	E	1386	A	B	C	D	E	1391	A	B	C	D	E	1396	A	B	C	D	E	1401	A	B	C	D	E	1406	A	B	C	D	E	1411	A	B	C	D	E	1416	A	B	C	D	E	1421	A	B	C	D	E	1426	A	B	C	D	E	1431	A	B	C	D	E	1436	A	B	C	D	E	1441	A	B	C	D	E	1446	A	B	C	D	E	1451	A	B	C	D	E	1456	A	B	C	D	E	1461	A	B	C	D	E	1466	A	B	C	D	E	1471	A	B	C	D	E	1476	A	B	C	D	E	1481	A	B	C	D	E	1486	A	B	C	D	E	1491	A	B	C	D	E	1496	A	B	C	D	E	1501	A	B	C	D	E	1506	A	B	C	D	E	1511	A	B	C	D	E	1516	A	B	C	D	E	1521	A	B	C	D	E	1526	A	B	C	D	E	1531	A	B	C	D	E	1536	A	B	C	D	E	1541	A	B	C	D	E	1546	A	B	C	D	E	1551	A	B	C	D	E	1556	A	B	C	D	E	1561	A	B	C	D	E	1566	A	B	C	D	E	1571	A	B	C	D	E	1576	A	B	C	D	E	1581	A	B	C	D	E	1586	A	B	C	D	E	1591	A	B	C	D	E	1596	A	B	C	D	E	1601	A	B	C	D	E	1606	A	B	C	D	E	1611	A	B	C	D	E	1616	A	B	C	D	E	1621	A	B	C	D	E	1626	A	B	C	D	E	1631	A	B	C	D	E	1636	A	B	C	D	E	1641	A	B	C	D	E	1646	A	B	C	D	E	1651	A	B	C	D	E	1656	A	B	C	D	E	1661	A	B	C	D	E	1666	A	B	C	D	E	1671	A	B	C	D	E	1676	A	B	C	D	E	1681	A	B	C	D	E	1686	A	B	C	D	E	1691	A	B	C	D	E	1696	A	B	C	D	E	1701	A	B	C	D	E	1706	A	B	C	D	E	1711	A	B	C	D	E	1716	A	B	C	D	E	1721	A	B	C	D	E	1726	A	B	C	D	E	1731	A	B	C	D	E	1736	A	B	C	D	E	1741	A	B	C	D	E	1746	A	B	C	D	E	1751	A	B	C	D	E	1756	A	B	C	D	E	1761	A	B	C	D	E	1766	A	B	C	D	E	1771	A	B	C	D	E	1776	A	B	C	D	E	1781	A	B	C	D	E	1786	A	B	C	D	E	1791	A	B	C	D	E	1796	A	B	C	D	E	1801	A	B	C	D	E	1806	A	B	C	D	E	1811	A	B	C	D	E	1816	A	B	C	D	E	1821	A	B	C	D	E	1826	A	B	C	D	E	1831	A	B	C	D	E	1836	A	B	C	D	E	1841	A	B	C	D	E	1846	A	B	C	D	E	1851	A	B	C	D	E	1856	A	B	C	D	E	1861	A	B	C	D	E	1866	A	B	C	D	E	1871	A
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武陵高中 98 學年度第一學期第二次期中考 物理科計算題作答區

班級： 座號： 姓名：

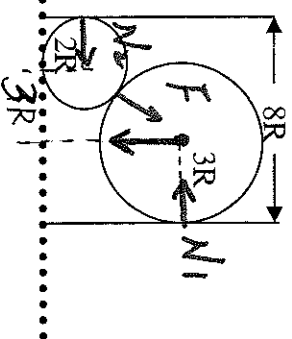
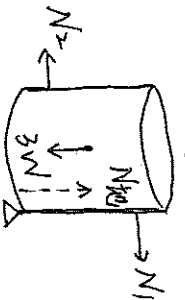
二、計算題：每題 10 分，共 20 分，未詳列算式或適當敘述理由者不予計分。

1. (a)

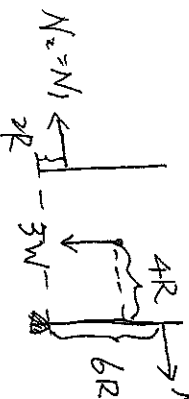


由力圖知 $F = \frac{5}{4} \cdot 3W = \frac{15}{4}W$
(且 $N_1 = \frac{3}{4} \cdot 3W$)

(b) 圓筒受力如圖：當 $N_1 \uparrow$ ，順時針力矩 \uparrow
使圓筒以右下端為支
點傾倒 (順時針方向)



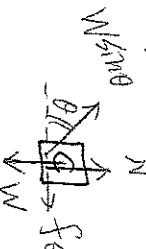
(c) 由力矩平衡 (設球重 W')



$\frac{3}{4}W' \cdot 6R = 3W \cdot 4R + \frac{3}{4}W' \cdot 2R$
 $\therefore W' = 4W$

2.

(a) B 與 C 一同下滑， $a = g \sin \theta$ 。

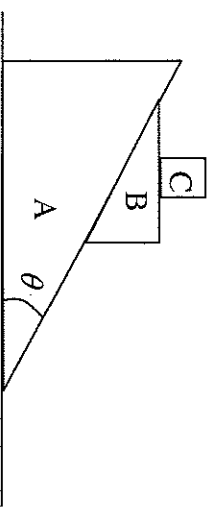


由 C 物受力知

$f_s = (W \sin \theta) \cos \theta$

or

$f_s = \frac{1}{2} W \sin 2\theta$



(b)

由 A 物受力知：

$f_{s地} = N \sin \theta$ ，其中 $N = 2W \cos \theta$ 代入

$\Rightarrow f_{s地} = W \sin 2\theta$

