1. A
2. D
3. C
4. C
5. D
6. D
7. B
8. C
9. B
10. A
11. C
12. A
13. D
14. B
15. A
16. B
17. D
18. D
19. C
20. C
21. B
22. B
23. C
24. B
25. C
26. B
27. B
28. C
29. B
30. A

1.	A	d=1/2 a t^2, 5m takes 1 sec, 20 m takes 2 sec. 1 sec longer
2.	D	Mgh
3.	C	L=Iw; I=2/5; w=v/r; v=sqrt(2g*10sin30/1.4)
4.	C	(FgSin-Fk)/m = v^2/2d, v^2=√(2gh/(7/5))
5.	D	All energy is now kinetic some is rotational not dissipated
6.	D	a=2, 8=1/2 at^2
7.	B	a=4/5 g so T=4/5 mg
8.	C	v=√(2ad)=√32
9.	B	a=0 (no change in center of mass of system)
10.	A	Table moving allows sphere to fall faster
11.	C	T^2=ka^3 third law
12.	A	v=√(GM/r)
13.	D	g is given to be 10m/s²
14.	B	Ptot=1.5*4; Pb = Ptot*.5/2 after they stick together
15.	A	Vo is the same for each d=.5at^2=50
16.	B	without gravity the arrow hits, if the monkey drops their relative acceleration is 0.
17.	D	Mg(L/2)(sqrt(2)/2)=(Mu)mgL(sqrt(2)/2)
18.	D	Half the speed means 1/4 of the energy which means 1/4 the distance
19.	C	3A initially and then half that when the cap is half charged
20.	C	U=(3/2)PV
21.	B	Eff=work/heat in; heat in = work + heat out; 250/(500+250)
22.	B	Ra=2Rb; amd by kep 3rd Ta = Tb(Ra/Rb)^(3/2)
23.	C	T=1lap/v; (4/3)V*3T=4laps
24.	B	12*1+.5(10)1^2=17
25.	C	T=2pi(sqrt(m/k))
26.	B	They will oscillate about the com. 1/3 of L from 2m. That segment has k_2=3k. T=2pi(sqrt(2M/3K))
27.	B	t=d/v; d=d_o/γ; (4.5ly/.6c)sqrt(1-.36)=6years
28.	C	Earth is in the same frame as the 4.5; 4.5/.8≈5.5
29.	B	t=d/γv; 4.5y=4.5y*c*sqrt(1-(v/c)^2)/v; c^2/v^2=2
30.	A	d=V_{rel}*t; V_{rel}=(V_1+V_2)/(1+V_1V_2)=140/148; for t see #27