SUBJECT: PHYSICS MIDTERM #2 CHAPTER 4: DYNAMICS, FORCE 4 NEWTONS LANS OF MOTION 1. 9) Draw a free body diagram including the weight of the rocked the thrust, and air resistance. Fig. Air resistance downward Name: Tyler Quit Score: 22/20 Fa accelerating straight up Thrust upward 1.25x10 ² Meight B) What is the rockets (Icceleration? F=ma F- (fa-mg) =ma 1.25x10 ² - (4.5x10 ⁶ + 4.9x10 ⁶) = 5x10 ⁶ a a= 3.1x10 ⁶ / 5x10 ⁵ = 6.2m1s	
1. a) Draw a free body diagram including the weight of the rocked the thrust, and air resistance. Fig. Air resistance downward Name: Tyler Quit Score: 22/20 Fa accelerating straight up Thrust upward 1.25x107 mg 5x105 kg weight b) what is the rocket's acceleration? F=ma Fi- (fa-mg) =ma 1.25x107 - (4.5x106 +4.9x106) =5x105 a	
the thrust, and all resistance. Fig. Air resistance downward 4.5x10°N Score: 22/20 Fa accelerating straight up Thrust upward 1.25x10°N Mark is the rocket's (Icceleration? F=ma Fi- (fq-mq)=ma 1.25x10°- (4.5x10°+4.9x10°)=5x10°-9	
Air resistance downward 4.5x10°N Score: 22/20 Fa Thrust upward 1.25x10°N Maccellerating straight up Sx105kg Meight b) what is the rockets accelleration? F=ma F- (fq-fq) =ma 1.25x10° - (4.5x10° +4.9x10°) =6x10° a	intas
Score: 22/20 Fa Thrust upward 1.25x107H B) what is the rocket's acceleration? F=ma F- (fq-fq) =ma 1.25x107 - (4.5x106 +4.9x106) =6x106 q	
thrust upward 1.26x1074 B) what is the rocket's (iccelleration? F=ma F- (fq-mq)=ma 1.26x107 - (4.5x106+4.9x106)=6x105q	
thrust upward 1.26x1074 b) what is the rocket's acceleration? F=ma F- (fq-fnq) =ma 1.26x107 - (4.5x106+4.9x106) =6x1069	
1.25x1074 mg 3x10 mg Neight b) what is the rocket's (icceleration? F=ma F- (fq-mg)=ma 1.25x107 - (4.5x106+4.9x106)=6x1059	
b) what is the rocket's (ICCELERATION? F=ma F- (fq-fnq) =ma 1.25 x107 - (4.5 x106 +4.9 x106) =6x105 q	
F=ma F7- (f9-f9) =ma 1.25 x107 - (4.5 x106 +4.9 x106) =6x105 9	
1.25 x107 - (4.5 x106 +4.9 x106) = 5×105 9	
9= 3.1x106/ 5x105 = 6.2m1s	
2. DAccording to Newton's 3rd Law; if the first player exerts a	(
force of 700N on the second player, what is the force the	
second player exerts on the first planer?	
P1=700N R 700 7 C -700N	
P2=-700N on)	
	· ·
3. What is the additional force is required to give the rocket	
deceleration?	
F=ma air resistance = 1000N	
$\alpha = -200 \mathrm{m/s^2}$	
m=2000kg	
F-1000N = 2000 (-200)	
= -4000,000 + 1000	
=-3,99,000NN=0Y -3.99 × 105N a	
5,11,0001-1	

SU	SUBJECT:			
4.				
	a) Drawa free body diagram including the two tension			
	vectors and the womens weight.			
	W) IR			
	15- T2			
	744.80			
	7U.DKg			
	•			
	b) Write down an expression Fact, x.			
	Fret, x= max Fret,= T2x-T, x			
	c) write down an expression for Frety			
	Fret, y = Tzy-Tiy			
	3 \$			
	d) Assuming Fact=0, calculate the tension in the two ropes.			
	Fnet=0			
	T1=744.8N-(TISIN15/60510)(SIN10)			
	X $T_2 cos 10 - T_1 sin 16 = 0$ $cos 15$			
	955T, +,045T, =744.8N			
	X { T2=Tisinis			
	COSID TI = 736.92			
	Y { t2 sin 10-T, c0 SIG -7.44.8 N=0			
	Tz=736.92N sin15/cos10			
	T1-7.44.8N-+2SINIO T27 -193.67			
	69519			
\neg	Great work!			

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SL	JBJECT:
1	CHAPTER S. FRICTION, DRACT, AND ELASTICITY
1	a) what maximum force can you exert horizontally on the
	crate without moving?
	W= 120(9.40)
	W=1.180N fs = 0.5(1,180N)
	4F4=0 -> fs = 590N
	Fatu=0
	Fn-1,100=0
	Fn=1.180
	b) If you continue to exert this force once the crate starts
	to slip, what will the magnitutele of its acceleration
	then be?
	fK=M+n F=ma
	690-354 = 120 (a)
	fk=0.3(1,180) 120 120
	+x=354N
	q=1.97m/s2
	If the coefficient of kinetic friction
2.	
	F=mq
	fx=0.1(n60526)
	my (sin 25; (0.1) (cos)29)=m/9
	$\alpha = \alpha + 1 \cdot (c_1 \cdot c_2 \cdot c_3) = \alpha + c_2 \cdot c_3 \cdot c_3$
	$a = 9.61 \cdot (\sin(25) - 0.1\cos(25))$ $-3.24m/s^2$
	5.211113
-	

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SU	BJECT:
3.	DRACT FORCE. If His area is 0.75 m2, the density of air is 1.225 kg m3
	and C=0.75, what is the magnitude of the drag force in Newtons?
	*. 40 m/s
	FD=1/2 CPAV2
	=(0,5)(.76)(1.225kg/m3)(0.75m2)(40m/s)2
	= 551.25 kgm/s ²
	-> = 561N.
4	If the Length of the beam decreases by 3mm, what is the Young's
	modulus of the wood?
	m=2300kg == (2300)(9.8m/s2)(10)
	$A = T(r)^2$ $T1(.04)^2(.003)$
	FIA = Y (\Delta L Lo)
	9=9.8m = 1.49 × 10 N/m2
	_ i

SUBJECT:
CHAPTER 6: Uniform Circular Mohon and Caravitation
1. What is the angular velocity of the ball as he throws it, in
radians per second?
V=144km/hr w=V/R
r= 0.6m
W-4010.5 = 80 rad sec
2 what is the ideal banking angle for a gentle turn of o.9km radius
on a highway with a 120km per hour speed limit, assuming
everyone travels at the limit?
tano=v2/rg tano=(33.3)2/900 (9.8)
V=176km \==333 0=4051//33 50 == 7.170
$V = 120 \text{km} + = 33.3 \theta = 49 \text{h}^{-1} \left((33.3)^{\frac{1}{2}} - 7 = 7.17 \text{ o} \right)$ $V = 900 \text{m} \qquad \qquad \left(900 (9.9) \right)$
q=9.8m/s
of Front's
3 a) which path may be taken at a higher speed, if both paths correspond
to the same force of friction and centripital force?
Fc=mV2 f=mN=/4mg
$V^2 = mgt$ $V = \sqrt{mgt}$
faction 1
V=(1)(9.8) (400)
-> = 62 m/s
2 P = (1)(9.8)(800)
(1.0)(80)
-> = 88 m/s
·
->> = 88 m/s

SU	SUBJECT:			
	b) suppose path I has a radius of ourvature of 400m, and path 2			
	has a radius of curvature of 800m. the wefficient of friction			
	is 1.0. If the force of friction balances the centripital force,			
	what are the trangential velocities of each race car?			
	f=MN			
	M=0.3 f=0.3(120kg)(9.81 m1s2)			
	+= 393N:			
	als Fret Im			
	588N-353N			
	120kg			
	9=1,96m152			
4.	BONUS POINTS:			
	a) calculate the acceleration due to growing at nephone due to Pluto			
	when they are 4.5 × 1012m apart, at they are now, the mass of			
	pluto 15 1.44×1022 kg			
	$q_{c} = (0.637 \times 10^{4} (1.4 \times 10^{22})) / (4.50 \times 10^{12})^{2}$			
	> ac = 4.61×10-14 m/s2			
	(+2) Bonus!			
	b) NOW calculate the acceleration due to gravity at Neptone due to			
	Uranus, presently about 2.5 x 1012 m apart, 4 compare it with that			
	due to Pluto the mase of Uranus is 8.62x1025kg.			
	ac=6.637 x104 (8.62 x1025) / (2.50 x1012)2			
	$a_c = 9.2 \times 10^{-10} \text{m/s}^2$			