				Requirement	Possible points
				scale is given for drawings	
				Force 1 drawn to scale on 1st set of axes	
				Force 2 drawn to scale on 2nd set of axes	
			C	seting up the Force equation correctly for Force 1	1
			Arithmetic	spiting r-hat into cosθx-hat+sinθy-hat	1
			ithr	multiplying mass times acceleration	1
		\vdash	Ar	distributing (FOIL-ing) the force into the component vectors	2
		Force		using correct units for mass and accelaration	2
		P	units	calculation finishes with units that have the correct order of magnitude	2
			٦	calculation leads to correct units for a force.	1
	le			Force 1 x-component entered in table	3
	component table			Force 1 y-component entered in table	3
			tic	seting up the Force equation correctly for Force 1	1
			Arithmetic	spiting r-hat into cosθx-hat+sinθy-hat	
	Jmc		rith	multiplying mass times acceleration	4
	Ö	e 2	٧	distributing (FOIL-ing) the force into the component vectors	
		Force 2	ts	using correct units for mass and accelaration	
		Ľ.	units	calculation finishes with units that have the correct order of magnitude	
				calculation leads to correct units for a force.	2
				Force 1 x-component entered in table	
exercise 1				Force 1 y-component entered in table	
erci				x-components are summed correctly to yeild Resultant x-component	
exe				y-components are summed correctly to yeild Resultant y-component	
	ing	Ford	ce 2 ha	as been drawn starting from the tip of Force 1 (or vice versa) on the lower set of	
	raw	T 1 F		axes and both are to scale.	3
	F_R drawing	The F	Resulta	ant force has been drawn from the origin of the lower axes to the tip of the sum	
	ъ.			of the component axes .	3
	ر ا	4 1	- احمد		,
	cTangent	tne	e angle	of the reultant vector from the x-axis has been found using the arctan function	
	[_] an§			the operand of arctan is set up as y-component over x-component units have been included and cancled correctly	
	ر ا			units have been included and cancled correctly	

	Ā	+	he alla	drent of the Resultant force has been accounted for and the actual angle of the	
	,		ne quu	resultant vector has been found	2
	ω			pythagorean theorum set up properly	5
	calc			units have been calculated correctly	3
	F _R (Arithmetic has been performed correctly	5
	ω			F=ma used properly	3
	calc			units have been calculated correctly	2
	F			Arithmetic has been performed correctly	2
	S	the	% diffe	erence has been found between the magnagues of the calculated and measured	
	difs			forces	7
	%			difference in angle between the calculated and meaured angles is calculated	5
	'			subtotal	90
				scale is given for drawings	3
				Force 1 drawn to scale on 1st set of axes	2
				Force 2 drawn to scale on 2nd set of axes	2
			ic	seting up the Force equation correctly for Force 1	1
			Arithmetic	spiting r-hat into cosθx-hat+sinθy-hat	1
			ithr	multiplying mass times acceleration	1
		1	Ar	distributing (FOIL-ing) the force into the component vectors	2
		Force 1	S	using correct units for mass and accelaration	2
		Ъ	units	calculation finishes with units that have the correct order of magnitude	2
			n	calculation leads to correct units for a force.	1
	<u>le</u>			Force 1 x-component entered in table	3
	component table			Force 1 y-component entered in table	3
	ent		ic	seting up the Force equation correctly for Force 1	1
)OU		met	spiting r-hat into cosθx-hat+sinθy-hat	1
	mp		Arithmetic	multiplying mass times acceleration	1
	8	7	Ar	distributing (FOIL-ing) the force into the component vectors	1
		Force 2	S	using correct units for mass and accelaration	2
		Fc	units	calculation finishes with units that have the correct order of magnitude	2
				calculation leads to correct units for a force.	2
				Force 1 x-component entered in table	3
e 2				Force 1 y-component entered in table	3

exercis. F _R drawing	Ford	-0.2 h	y-components are summed correctly to yeild Resultant y-component	3			
_	Ford	-0 2 h-		3			
aw.		Le Z III	s been drawn starting from the tip of Force 1 (or vice versa) on the lower set of				
			axes and both are to scale.	3			
dra	The F	Resulta	ant force has been drawn from the origin of the lower axes to the tip of the sum				
٦			of the component axes .	3			
ent	the	e angle	of the reultant vector from the x-axis has been found using the arctan function	2			
ArcTangent			the operand of arctan is set up as y-component over x-component	2			
сТа			units have been included and cancled correctly	1			
Ā	tl	he qua	drent of the Resultant force has been accounted for and the actual angle of the				
			resultant vector has been found	2			
<u> </u>			pythagorean theorum set up properly	5			
calc			units have been calculated correctly	3			
π,			Arithmetic has been performed correctly	5			
S			F=ma used properly	3			
calc			units have been calculated correctly	2			
ت			Arithmetic has been performed correctly	2			
S	the	% diffe	rence has been found between the magnagues of the calculated and measured				
difs			forces	7			
%			difference in angle between the calculated and meaured angles is calculated	5			
			subtotal	90			
			scale is given for drawings	3 2			
	Force 1 drawn to scale on 1st set of axes						
			Force 2 drawn to scale on 2nd set of axes	2			
		ic	seting up the Force equation correctly for Force 1	1			
		Arithmetic	spiting r-hat into cosθx-hat+sinθy-hat	1			
		ithr	multiplying mass times acceleration	1			
	1	Ar	distributing (FOIL-ing) the force into the component vectors	2			
	Force	10	using correct units for mass and accelaration	2			
	Ъ	units	calculation finishes with units that have the correct order of magnitude	2			
			calculation leads to correct units for a force.	1			
			Force 1 x-component entered in table	3			

Force 1 y-component entered in table seting up the Force equation correctly for Force 1 Arithmetic spiting r-hat into $\cos\theta x$ -hat+ $\sin\theta y$ -hat multiplying mass times acceleration component table Force 2 distributing (FOIL-ing) the force into the component vectors using correct units for mass and accelaration units calculation finishes with units that have the correct order of magnitude calculation leads to correct units for a force. Force 2 x-component entered in table Force 2 y-component entered in table seting up the Force equation correctly for Force 1 Arithmetic spiting r-hat into $cos\theta x$ -hat+ $sin\theta y$ -hat multiplying mass times acceleration distributing (FOIL-ing) the force into the component vectors Force 3 exercise 3 using correct units for mass and accelaration units calculation finishes with units that have the correct order of magnitude calculation leads to correct units for a force. Force 3 x-component entered in table Force 3y-component entered in table x-components are summed correctly to yeild Resultant x-component y-components are summed correctly to yeild Resultant y-component Force 2 has been drawn starting from the tip of Force 1 (or vice versa) on the lower set of drawing axes and both are to scale. The Resultant force has been drawn from the origin of the lower axes to the tip of the sum of the component axes the angle of the reultant vector from the x-axis has been found using the arctan function ArcTangent the operand of arctan is set up as y-component over x-component units have been included and cancled correctly the quadrent of the Resultant force has been accounted for and the actual angle of the resultant vector has been found pythagorean theorum set up properly calc units have been calculated correctly

5	Arithmetic has been performed correctly	F.
3	F=ma used properly	<u></u>
2	units have been calculated correctly	calc
2	Arithmetic has been performed correctly	FE
	the % difference has been found between the magnagues of the calculated and measured	.s
7	forces	difs
5	difference in angle between the calculated and meaured angles is calculated	%
106	subtotal	
286	total	-