-	Requir	ement	ŀ		Possible
	(Cquii	CITICIT			points
				scale is given for drawings	
				Force 1 drawn to scale on 1st set of axes	2
				Force 2 drawn to scale on 2nd set of axes	2
			tic	seting up the Force equation correctly for Force 1	1
			Arithmetic	spiting r-hat into cosθx-hat+sinθy-hat	
			rith	multiplying mass times acceleration	1
		1	Ā	distributing (FOIL-ing) the force into the component vectors	2
		Force 1	Ş	using correct units for mass and accelaration	2
		Fc	units	calculation finishes with units that have the correct order of magnitude	2
			٦	calculation leads to correct units for a force.	1
	<u>e</u>			Force 1 x-component entered in table	3
	component table			Force 1 y-component entered in table	3
	ent		tic	seting up the Force equation correctly for Force 1	1
	noc		Arithmetic	spiting r-hat into cosθx-hat+sinθy-hat	
	mc		rith	multiplying mass times acceleration	1
	S	5 2	٧	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 1				Force 1 y-component entered in table	3
rcis				x-components are summed correctly to yeild Resultant x-component	3
exercise 1				y-components are summed correctly to yeild Resultant y-component	3
	Bu	Ford	ce 2 ha	is been drawn starting from the tip of Force 1 (or vice versa) on the lower set of	
	Жi			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	
	т _к			of the component axes .	3
	int	the	angle	of the reultant vector from the x-axis has been found using the arctan function	2
	cTangent			the operand of arctan is set up as y-component over x-component	2
	сТа			units have been included and cancled correctly	

	٩r	+	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
	U			pythagorean theorum set up properly	5
	F _R calc			units have been calculated correctly	3
	F_{R}			Arithmetic has been performed correctly	5
	U			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
			า	calculation leads to correct units for a force.	1
	<u> </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
	on6		net	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
			٦	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

cis				x-components are summed correctly to yeild Resultant x-component	3
exercis				y-components are summed correctly to yeild Resultant y-component	3
θ	ing	For	ce 2 ha	as been drawn starting from the tip of Force 1 (or vice versa) on the lower set of	2
	raw			axes and both are to scale.	3
	F _R drawing	i ne i	Resulta	ant force has been drawn from the origin of the lower axes to the tip of the sum	2
				of the component axes .	3
	nt	the	e angle	e of the reultant vector from the x-axis has been found using the arctan function	2
	nge			the operand of arctan is set up as y-component over x-component	2
	ArcTangent			units have been included and cancled correctly	1
	Ar	t	he qua	drent of the Resultant force has been accounted for and the actual angle of the	
				resultant vector has been found	2
	lc			pythagorean theorum set up properly	5
	F _R calc			units have been calculated correctly	3
	F			Arithmetic has been performed correctly	5
	calc			F=ma used properly	3
	F _E C3			units have been calculated correctly	2
	ш.			Arithmetic has been performed correctly	2
	difs	the	% diffe	erence has been found between the magnagues of the calculated and measured	
	р %			forces	7
				difference in angle between the calculated and meaured angles is calculated	5
				subtotal	90
				scale is given for drawings Force 1 drawn to scale on 1st set of axes	3
				Force 2 drawn to scale on 1st set of axes	2
			()		1
			Arithmetic	seting up the Force equation correctly for Force 1 spiting r-hat into cosθx-hat+sinθy-hat	1
			.hm	multiplying mass times acceleration	1
		┰	Arit	distributing (FOIL-ing) the force into the component vectors	2
		Ge		using correct units for mass and accelaration	2
		Force	units	calculation finishes with units that have the correct order of magnitude	2
			'n	calculation leads to correct units for a force.	1
				Force 1 x-component entered in table	3
•			<u> </u>	,	

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 distributing (FOIL-ing) the force into the component vectors Force 2 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	4
3	F=ma used properly	IC
2	units have been calculated correctly	calc
2	Arithmetic has been performed correctly	F _E
	the % difference has been found between the magnagues of the calculated and measured	Ś
7	forces	difs
5	difference in angle between the calculated and meaured angles is calculated	%
106	subtotal	
286	total	_