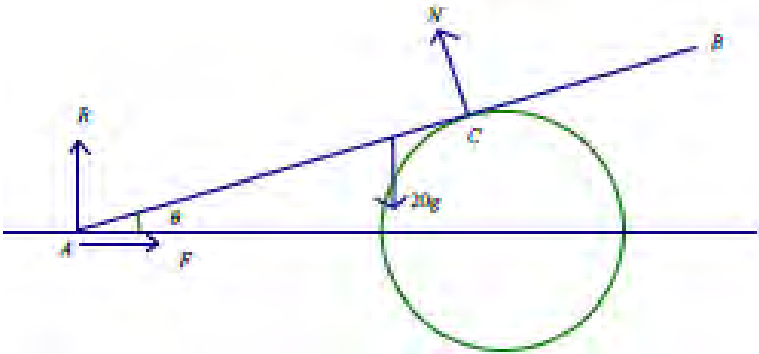


Question 4 (Total 11 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	The drum is smooth so there is no friction; thus there is no component parallel to the ramp and therefore the reaction is perpendicular to the ramp	B1	This mark is given for a correct explanation stated
(b)			
	$M(A): 5N = 20g \times 4 \cos \theta$	M1	This mark is given for a method to find moments about A
	$N = 16g \cos \theta$ $N = 145 \quad (144.73846\dots)$	A1	This mark is given for a correct value for N
	$R + N \cos \theta = 20g$	M1	This mark is given for finding an equation in R by resolving vertically
	$R + N \times \frac{12}{13} = 20g$	A1	This mark is given for a correct equation in R
	$F = N \sin \theta$	M1	This mark is given for finding an equation in F by resolving horizontally
	$F = N \times \frac{5}{13}$	A1	This mark is given for a correct equation for F
	$R = 62.4 \text{ N}, F = 55.7 \text{ N}$	M1	This mark is given for using trigonometry to correctly solve for R and F
	$ \text{Force} = \sqrt{62.4^2 + 55.7^2}$	M1	This mark is given for a method to find the resultant force
	$= 83.6 \text{ N}$	A1	This mark is given for correctly finding the resultant force
(c)	The magnitude of the normal reaction will decrease	B1	This mark is given for a correct reason given