Question Number	Answer		Mark
13(a)			3
	Vertical component of tension = $T \cos 76^{\circ}$	(1)	
	Use of 650 N = $2 \times \text{vertical component of tension}$	(1)	
	T 124 × 103 (21)	(1)	
	$T = 1.34 \times 10^3 (\text{N})$	(1)	
	Example of calculation		
	$\frac{\text{Example of calculation}}{650 \text{ N} = 2 T \cos 76^{\circ}}$		
	$T = \frac{1}{2} \times 650 \text{ N} \div \cos 76^\circ = 1343 \text{ N}$		
13(b)(i)	72 000 70 200 70		3
()()	Use of sin76° or cos 14° to find new length of cord	(1)	
		, ,	
	Use of $\varepsilon = \Delta x \div x$	(1)	
	$\varepsilon = 0.03 \text{ or } 3\%$	(1)	
	Francis of colories		
	Example of calculation $(x + \Delta x) \div 2 = 60 \text{ m} \div \sin 76^{\circ} = 61.8 \text{ m}$		
	$(x + \Delta x) \div 2 - 60 \text{ m} \div \sin 76 - 61.8 \text{ m}$ $\Delta x = (61.8 \times 2) \text{ m} - 120.0 \text{ m} = 3.7 \text{ m}$		
	$\varepsilon = 3.7 \text{ m} \div 120 \text{ m} = 0.031$		
	6 3.7 III · 120 III · 0.031		
13(b)(ii)			3
()()	Use of $\sigma = F \div A$ with $F =$ tension from (a)	(1)	
	Use of $E = \sigma \div \varepsilon$	(1)	
	$E = 1.4 \times 10^8 \text{Pa (ecf from (a) and (b)(i))}$	(1)	
	Francis of colonistics		
	Example of calculation $\sigma = 1.34 \times 10^3 \text{ N} \div 3.14 \times 10^{-4} \text{ m}^2 = 4.28 \text{ MPa}$		
	$\sigma = 1.34 \times 10^{6} \text{ N} - 3.14 \times 10^{14} \text{ m}^{2} = 4.28 \text{ MPa}$ $E = 4.28 \times 10^{6} \text{ Pa} \div 0.031 = 1.38 \times 10^{8} \text{ Pa}$		
	L = 7.20^ 10 1a · 0.031 = 1.30 ^ 10 1a		_

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Total for question 13