



The Open University of Sri Lanka  
Faculty of Engineering Technology

Industrial Studies Program

Final Examination- 2008

**AEZ3238 Mathematics for Agriculture**

Date : 02-04-2009  
Time : 0930-1230 hours

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## SECTION II

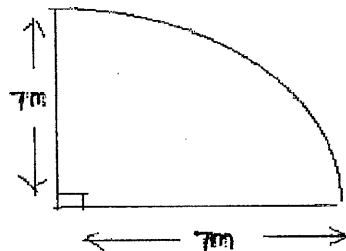
1. Solve the following equations;

(a) (i)  $\frac{2(2x-1)}{3} - \frac{2}{5} = \frac{x+3}{15}$

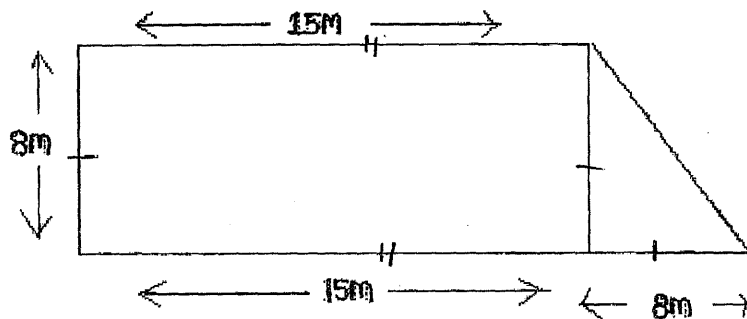
(ii)  $x + 2y = 9$   
 $2x - y = -2$

(b) Length of a rectangular land is 10m more than its width. The area of the land is 600m<sup>2</sup>. Find the length and width of the land

2. (a) Find the area of the following shape lands  
(i)



(ii)



(b) When a man see the top of a tree, he observe that angle of elevation is  $30^\circ$ . When he walked 8m towards the tree he observes that the angle of elevation is  $60^\circ$ . Find the height of the tree.

(3) (a) Prove that

(i)  $\sin^2\theta + \cos^2\theta = 1$

(ii)  $\sec^2\theta = 1 + \tan^2\theta = 1 + \tan^2\theta$

(iii)  $\operatorname{cosec}^2\theta = 1 + \cot^2\theta$

(b) Prove that

$$\frac{1}{\cot A + \tan A} = \sin A \cdot \cos A$$

(c) Verify that  $\tan^2 30^\circ + \tan^2 45^\circ + \tan^2 60^\circ = 4 \frac{1}{3}$

(4)

(a) Differentiate with respect to  $x$

(i)  $Y = (x^2 + 2x)(x^{1/2})$

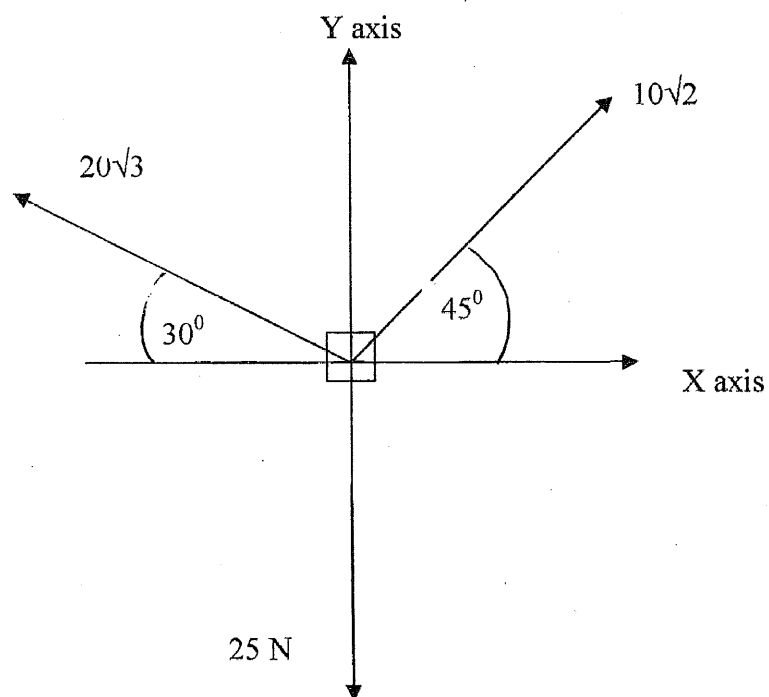
(ii)  $Y = \frac{(x+3)}{\sqrt{x+1}}$

(b) Evaluate the following integrals

(i)  $\int_0^2 (x^2 + x + 1) dx$

(ii)  $\int X e^x dx$

(5) (a)

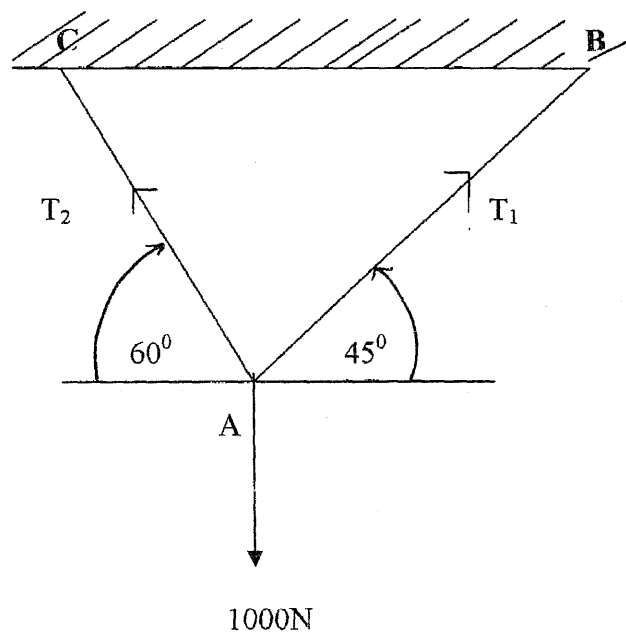


For the above system of forces,

Find the following

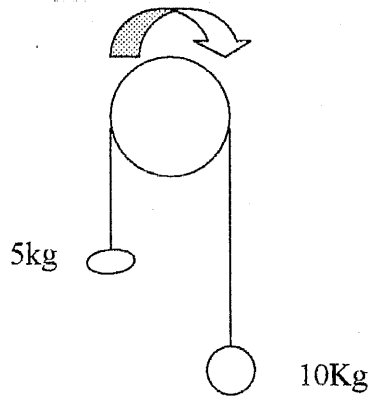
- (i) Horizontal component (i.e.  $\Sigma X$ )
- (ii) Vertical Component (i.e.  $\Sigma Y$ )  
(You can assume  $\sqrt{3} = 1.732$ )
- (iii) Hence find the resultant of the above system. (Answer should be nearest 2 decimal places )
- (iv) The angle that resultant make with the horizon.

(b)



A 1000 N weight object is hanging from A. (see above figure) using two string AB and AC connected to two points B and C in horizontal roof. Find T<sub>1</sub> and T<sub>2</sub> the tension of the two strings AB and AC.

(6) (a)

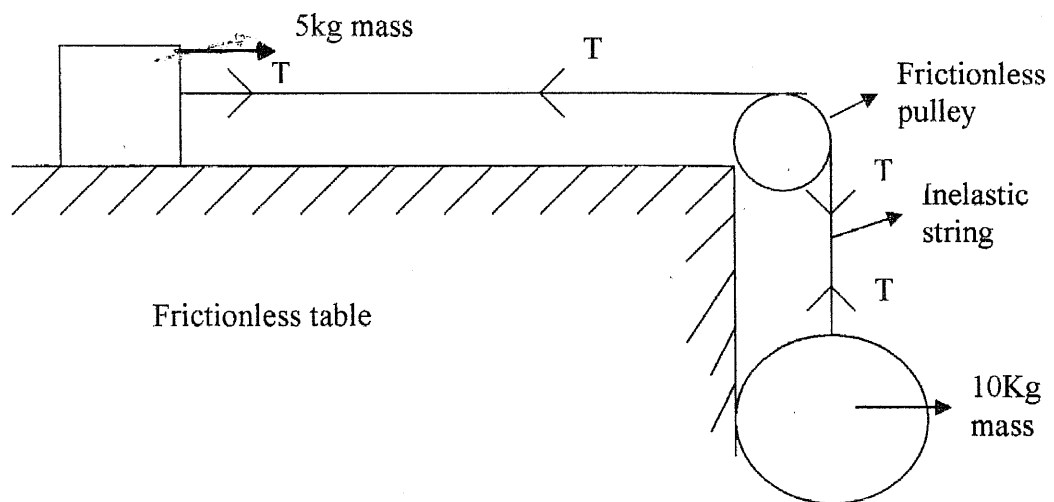


Two objects A and B of masses 10 Kg and 5 Kg are hang over a freely rotated frictionless pulley using a inelastic string . If the system move,

Find

- (i) Acceleration of the system
- (ii) Tension of the string

(b)



Two object of masses of 10Kg and 5Kg are keep as shown in the figure above on a horizontal table using a frictionless freely rotation pulley. Coefficient of friction between table and the 5Kg object,  $\mu = 0.25$

Find the

- (i) Acceleration of the system
- (j) Tension T of the string
- (k) Resultant force acting on the pulley due to the tension of the string