

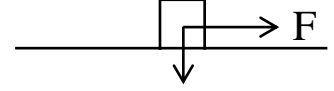
(الأسئلة)

الرياضيات التطبيقية - الاستاتيكا (باللغة الإنجليزية)

تنبيه مهم: يسلم الطالب ورقة امتحانية باللغة العربية مع ورقة المترجمة

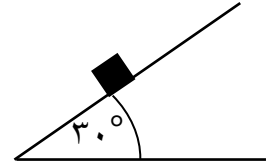
**Note: Calculators are allowed.****First: Choose the correct answer from those given:**

١) If a body of weight  $\wedge$  kg.wt. is placed on a rough horizontal plane, the static coefficient of friction between it and the body is  $\frac{1}{4}$ , then the horizontal force which makes the body about to move = ..... Newton.



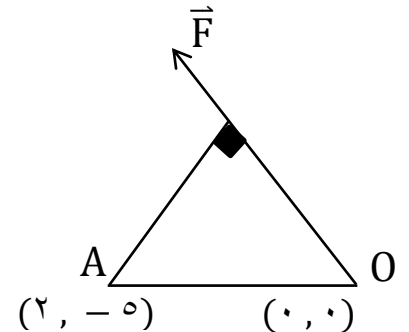
- a) ٢                      b) ٩.٨                      c) ١٩.٦                      d) ٤.٩

٢) If a body is placed on a rough inclined plane and was about to slide down the plane under the act of its weight only when the angle of the inclination of the plane was  $٣٠^\circ$ , then the static coefficient of friction = .....



- a)  $\frac{1}{\sqrt{3}}$                       b)  $\sqrt{3}$                       c)  $\frac{1}{3}$                       d) ١

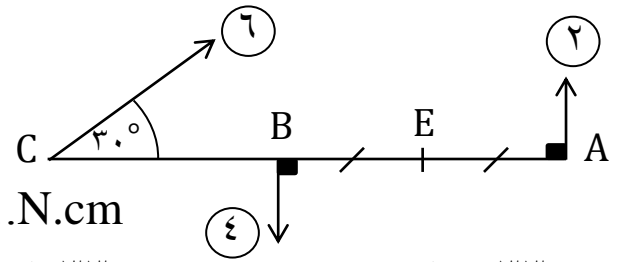
٣) If  $\vec{F} = ٣\hat{i} + ٤\hat{j}$  acts at the origin, then the length of perpendicular drawn from point A  $(٢, -٥)$  to the line of action of  $\vec{F}$  equals ..... length unit.



- a) ٥.٢                      b) ٤.٦                      c) ١.٦                      d) ١.٤

٤) In the opposite figure:

If  $AB = BC = ١٢$  cm ,  
E is mid-point of  $\overline{AB}$  , then  
the sum of moments about E = .....N.cm

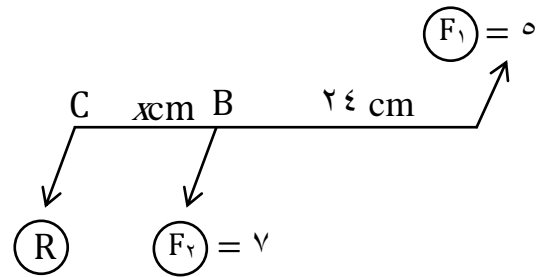


- a) -٦٠                      b) ٦٠                      c) ٣٣                      d) -٣٣

٥) In the opposite figure:

If  $\vec{F}_1 // \vec{F}_2$  ,  $F_1 = ٥$  Newton ,  $F_2 = ٧$  Newton ,  $AB = ٢٤$  cm ,  
 $BC = x$  cm , then  $x =$  ..... cm.

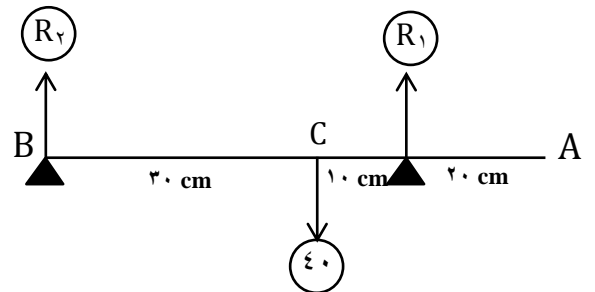
- a) ٦٠                      b) ٤٠  
c) ٢٤                      d) ١٢



٦) In the opposite figure:

If the system is in equilibrium,  
then  $R_1 - R_2 =$  ..... gm.wt.

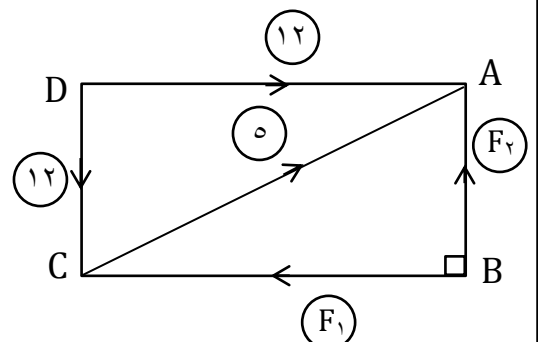
- a) ٤٠                      b) ٣٠  
c) ٢٠                      d) ١٠



٧) In the opposite figure:

ABCD is a rectangle in which  $AB = ٦$  cm ,  
 $BC = ٨$  cm. If the system is in equilibrium  
and the forces are measured in Newton,  
then  $F_1 + F_2 =$  ..... Newton.

- a) ٧                      b) ٩                      c) ١٦                      d) ٢٥



٨) If  $\vec{F}_1 = 3\hat{i} - b\hat{j}$  ,  $\vec{F}_2 = a\hat{i} - 5\hat{j}$  form a couple, then

(a , b) = .....

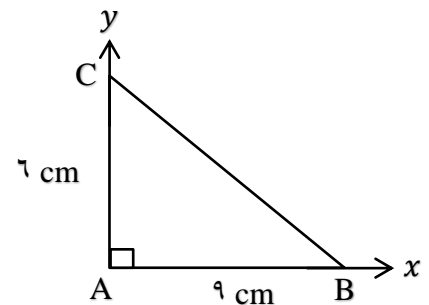
- a)  $(-3, -5)$       b)  $(-3, 5)$       c)  $(3, -5)$       d)  $(3, 5)$

٩) The centre of gravity of a system formed of two masses  $4, 1 \text{ kg}$ .  
The distance between them  $2 \text{ m}$  is at a distance equals ..... m  
from the first mass.

- a)  $1/4$       b)  $2/8$       c)  $2/1$       d)  $1/2$

١٠) The center of gravity of three equal masses each of  $2 \text{ kgm}$  placed at  
the vertices of a right-angled triangle whose right angle side  
lengths are  $3 \text{ cm}$  ,  $4 \text{ cm}$  is .....

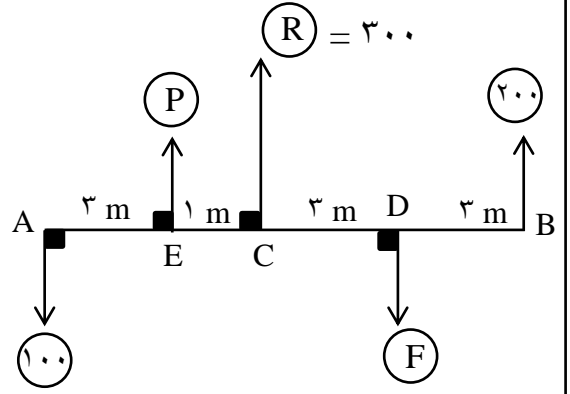
- a)  $(\frac{9}{4}, 3)$       b)  $(2, 3)$       c)  $(3, 2)$       d)  $(6, 4)$







٣) The opposite figure indicates a light rod of neglected weight. The parallel forces indicated in the figure acted upon the rod. If the magnitude of the resultant is  $300$  Newton and acts upwards and its point of action is at  $4$  m from A .  
Find the value of each of F and P .



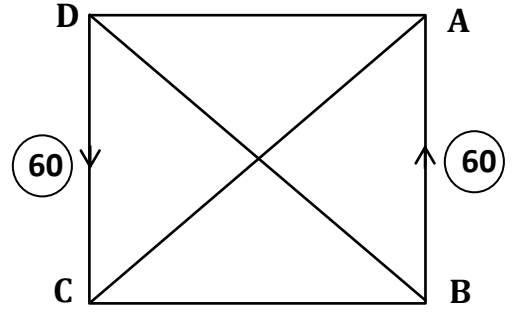
**Complete:**.....



٥) ABCD is a square of side length ١٠ cm.

Two forces ٦٠, ٦٠ Newton act along  $\overrightarrow{BA}$  ,  $\overrightarrow{DC}$  .

Find two equal forces in magnitude and act at A , C parallel to  $\overrightarrow{BD}$  to form a couple equivalent to the given couple.

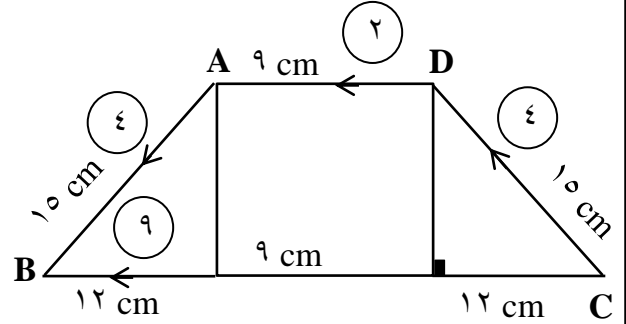


**Complete:** .....



٦) ABCD is an isosceles, trapezium in which  $AB = DC = 10 \text{ cm}$  ,  
 $AD = 9 \text{ cm}$  ,  $BC = 33 \text{ cm}$

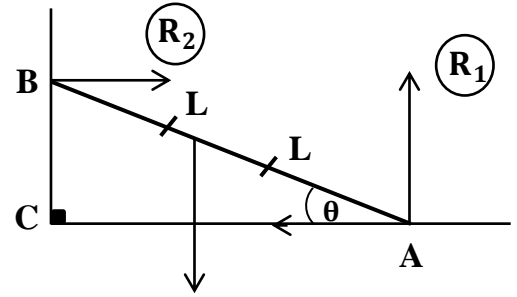
Forces of magnitudes:  $40$  ,  $99$  ,  $40$  ,  $27$  Newton act along:  $\overrightarrow{AB}$  ,  $\overrightarrow{BC}$  ,  
 $\overrightarrow{CD}$  ,  $\overrightarrow{AD}$  . Prove that the system form a couple and find its moment  
 norm.



**Complete:** .....

٧) A uniform rod rests in a vertical plane with its upper end on a vertical smooth wall and with its lower end on a horizontal plane, the static coefficient of friction between them equals  $\frac{1}{3}$ .

Find the measure of the angle of inclination of the rod to the horizontal when it is about to slide away from the wall.



**Complete:** .....

