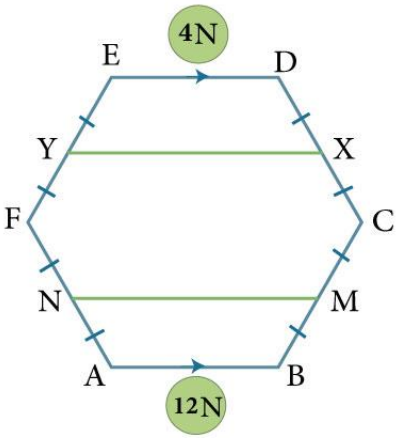
اختبار تجريبى

استاتيكا (باللغة الانجليزية) الصف الثالث الثانوى

1) In the opposite figure:

ABCDEF is a regular hexagon, X, Y, M, N are mid-points of $\overline{CD}, \overline{EF}, \overline{BC}$ and $\overline{AF}$ respectively, then their resultant acts in the direction ……



(A) $\overrightarrow{NM}$

(B) $\overrightarrow{XY}$

(C) $\overrightarrow{EC}$

(D) $\overrightarrow{AB}$

2) A force $\vec{F}$ acts in the xy-plane and equation of its line of action is y + 4x = 5, if A(1, 5), B(2, 1) two points in the plane, then…….

(A) $M_A = - M_B$

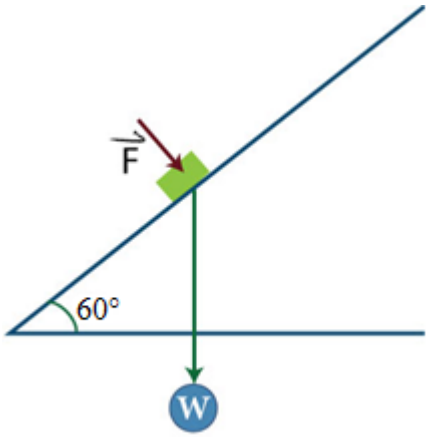
(B) $M_A < M_B$

(C) $M_A = M_B$

(D) $M_A > M_B$

3) In the opposite figure:

A body of weight (w) kg.wt placed on a rough plane inclines by an angle of measure 60° to the horizontal, a perpendicular force $\vec{F}$ on the plane of magnitude (2w)kg.wt acts on the body to make the body about to slide.



Then the coefficient of static friction between the body and the plane equals…….60°

(A) $\frac{2\sqrt{3}}{7}$

(B) $\frac{1}{\sqrt{3}}$

(C) $\frac{\sqrt{3}}{5}$

(D) $\frac{\sqrt{3}}{2}$

4) A horizontal force of magnitude 50 Newton acts on a body placed on a rough horizontal plane, if the weight of the body is 75 newton,

Then the coefficient of kinetic friction may be …….

(A) $\frac{3}{4}$

(B) $\frac{5}{6}$

(C) $\frac{3}{5}$

(D) $\frac{5}{7}$

5) A force of magnitude $2\sqrt{17}$ force unit acts in the coordinate plane and eqation of its line of action is $y-4x=12$, then the norm of moment force about the origin point =…… moment unit.

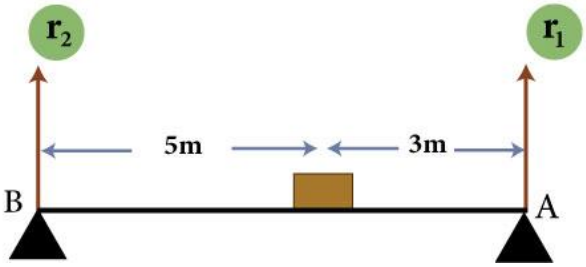
(A) 24

(B) 26

(C) $24\sqrt{17}$

(D) $\sqrt{17}+3$

6) The opposite figure:



Shows a uniform wooden board of length 8 m, whose mass is 20 kg for each metre of its length, if it rests horizontally on two supports A, B and carries a box of mass 200kg, then $r_1 - r_2$ =……. kg.wt

(A) 205

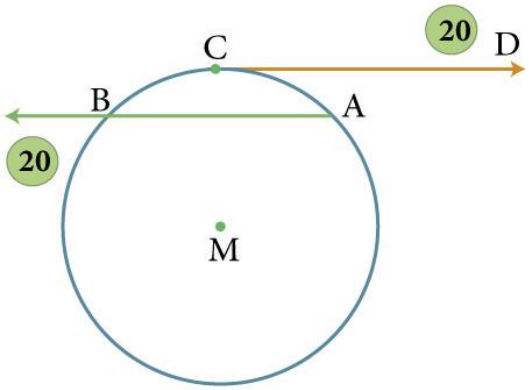
(B) 150

(C) 50

(D) 360

7) In the opposite figure:

M is a circle of radius length 10 cm, $\overline{AB}$ is a chord in it, $\overrightarrow{CD}$ is a tangent at C where AB = 16cm, two forces of magnitude 20, 20 newton as shown in the figure and formed a couple, then the norm of its moment = ……. newton.cm



(A) 200

(B) 40

(C) 120

(D) 80

8) The forces $\overrightarrow{F_1} = 3\hat{\imath} - 5\hat{\jmath}$, $\overrightarrow{F_2} = -\hat{\imath} + 4\hat{\jmath}$, $\overrightarrow{F_3} = m\hat{\imath} + \hat{\jmath}$ act at the point A(-1, n), B(0, 1), C(2, 3) respectively and the system formed a couple its moment equals $-10\hat{k}$, then m + n =…….

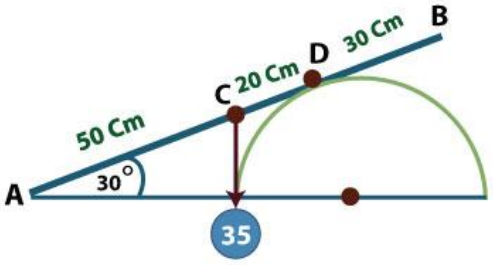
(A) 6

(B) 10

(C) 8

(D) 12

9) In the opposite figure:
$\overline{AB}$ is a uniform rod of length 100 cm and of weight 35 kg.wt rests from its end A on a rough horizontal ground and from point D on a smooth metallic semi sphere, if the rod is about to slide, then the magnitude of reaction of the semi sphere on the rod = …..kg.wt



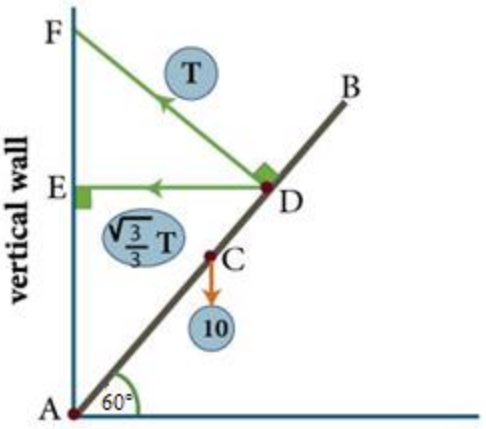
(A) $\frac{35\sqrt{3}}{2}$

(B) 25

(C) 35

(D) $\frac{25\sqrt{3}}{2}$

10) In the opposite figure:
$\overline{AB}$ is a uniform rod of length 90 cm and its weight is 10 kg.wt, fixed from its end A at a hinge, the rod is pulled by two inelastic strings from point D where CD = 15 cm, if the rod became in equilibrium position when it inclines with the horizontal by angle of measure 60°, then the magnitude of the tension T=…….kg.wt.



(A) 2.5
(B) 5
(C) 5.5
(D) 6

11) Two forces $\overrightarrow{F_1} = 5\hat{\imath} - 4\hat{\jmath}, \overrightarrow{F_2} = 15\hat{\imath} - 12\hat{\jmath}$ act at the two points A (0, 3), B (2, 0) respectively, then the equation of the line of their resultant is…….

(A) $4x + 5y = 30$

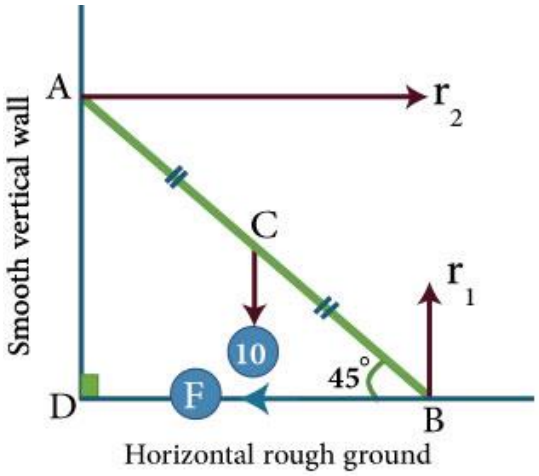
(B) $16x - 20y = 39$

(C) $16x + 20y = 39$

(D) $4x - 20y = 9$

12) In the opposite figure:

$\overline{AB}$ is a uniform rod of weight 10 kg.wt, if coefficient of static friction between the rod and the ground is $\frac{1}{5}$, then the magnitude of the least horizontal force F acts at B to prevent the rod from sliding is…….kg.wt



(A) 5

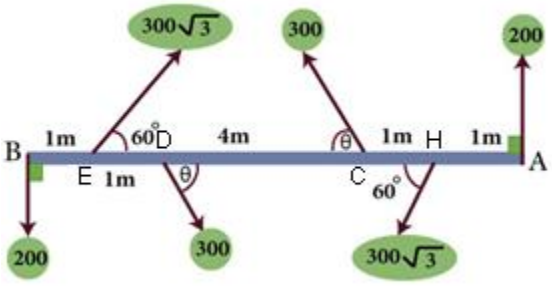
(B) 3

(C) 4

(D) 6

13) In the opposite figure:

$\overline{AB}$ is a rod of negligible weight.
If the rod equilibrate under action of the forces shown in the figure,
then: sin θ =……



(A) $\frac{7}{12}$

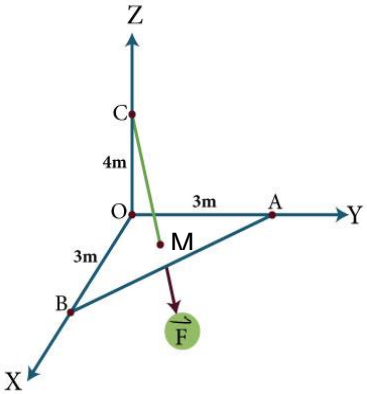
(B) $\frac{1}{2}$

(C) $\frac{11}{12}$

(D) $\frac{5}{11}$

14) In the opposite figure:

$\vec{F}$ acts at point M (point of intersection of medians of triangle AOB) where $\|\vec{F}\| = 15\sqrt{2}$ N., then the norm of the moment of the force about the origin point =……N.m



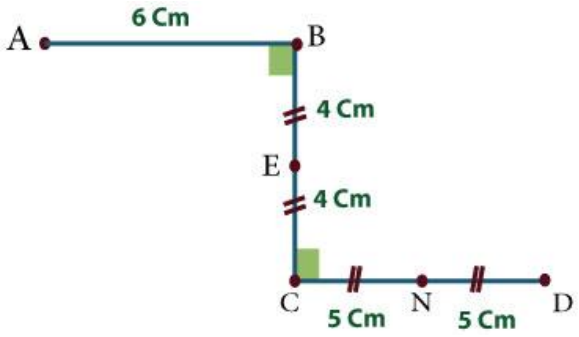
(A) $15\sqrt{2}$

(B) $20\sqrt{2}$

(C) $9\sqrt{2}$

(D) $16\sqrt{2}$

15) In the opposite figure:



AB = 6cm, BC = 8cm, CD = 10 cm E, N are midpoints of $\overline{BC}, \overline{CD}$ masses of magnitudes 5, 10, 15 gm places on A, E, N respectively, then the centre of gravity of the system with respect to the point C is……..

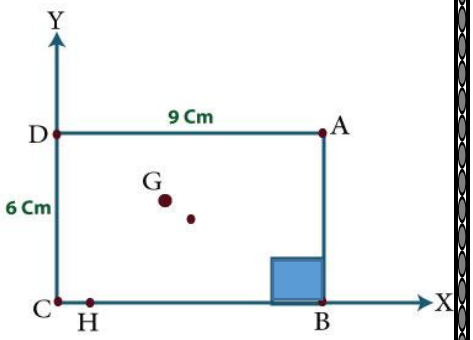
(A) $(\frac{3}{2}, \frac{8}{3})$

(B) $(\frac{2}{3}, \frac{1}{3})$

(C) $(\frac{-2}{3}, \frac{8}{3})$

(D) $(\frac{1}{3}, \frac{-1}{8})$

16) In the opposite figure:



A fine lamina of uniform thickness and density in the form of rectangle ABCD whose dimensions are 9cm, 6cm. A square is cut off from one of its corners (as shown in the figure). If the centre of gravity of the remainder part is G(3.9, 3.3) .
If the lamina is freely suspended from point H∈ $\overline{BC}$ where CH = 0.6cm, then the measure of the angle of inclination of $\overleftrightarrow{BC}$ to the vertical in the equilibrium position=……..

(A) 30°

(B) 40°

(C) 36°

(D) 45°

17) A man cannot push a container contains 13 boxes, the weight of each is 8 kg.wt on a rough horizontal plane, the coefficient of static friction between the plane and the container equals $\frac{1}{4}$, if the man pushes the container by a horizontal force of magnitude 20 kg.wt and the weight of the container equals the weight of one box, then the number of boxes must remove from the container to be about to move=…….

(A) 4

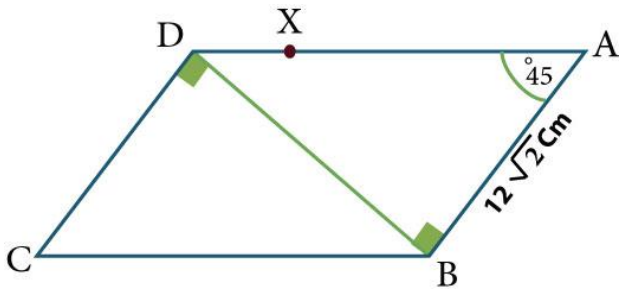
(B) 9

(C) 8

(D) 3

18)In the opposite figure:

ABCD is a fine lamina of a uniform thickness and density in the form of parallelogram is freely suspended from point X ∈ $\overline{AD}$, if it equilibrates when $\overline{AD}$ in horizontal position, then XD =…….cm



(A) 12

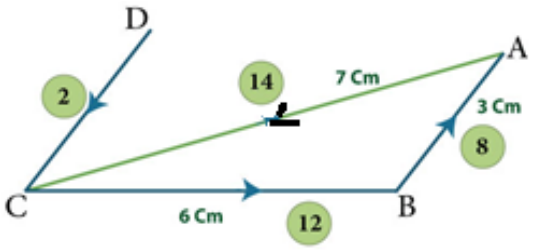
(B) $2\sqrt{2}$

(C) $6\sqrt{2}$

(D) 6

19) In the opposite figure:

Forces of magnitude: 8, 14, 12, 2 Newton act in directions $\overrightarrow{BA}$, $\overrightarrow{AC}, \overrightarrow{CB}, \overrightarrow{DC}$ respectively, where $\overline{AB}//\overline{DC}$ if the system equivalent a couple. Find norm of the moment couple.



20) In the opposite figure:

Forces act as shown in the figure,

Find the magnitude and the direction of their resultant.