وزارة التربية والتعليم و التعليم الفنى
الإدارة المركزية للتعليم العام
إدارة تنمية مادة الرياضيات

برعاية معالي وزير التربية والتعليم و التعليم الفنى
السيد الأستاذ/ محمد عبد اللطيف

وتوجيهات رئيس الإدارة المركزية للتعليم العام

د/ هالة عبد السلام خفاجى

إشراف علمي

مستشار الرياضيات

أ/ منال عزقول

أداءات وتقييمات لمنهج تطبيقات الرياضيات لغات

للصف الثانى الثانوي "علمى"

الفصل الدراسى الأول

للعام الدراسي 2026 / 2027

الأسبوع الرابع

لجنة الإعداد

أ/ محمد عبد العاطى أ/ محمود السيد محمد أ/ عفاف جاد

ترجمة

أ/ محمود سليمان نظيم

مراجعة الترجمة

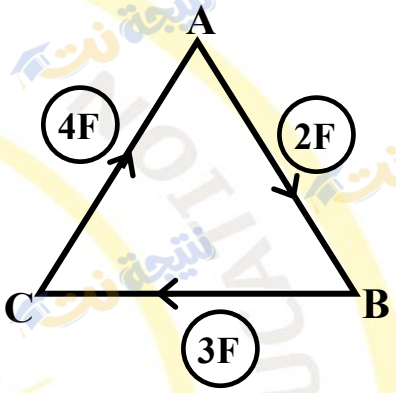
أ/ شريف البرهامى أ/ عمرو فاروق

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Classroom Performance (Week Four) - Mathematics Applications

(1) If $\overrightarrow{F_1} = 3\hat{i} + 2\hat{j}$, $\overrightarrow{F_2} = a\hat{i} + b\hat{j}$, $\overrightarrow{F_3} = -12\hat{i} + 7\hat{j}$ are three coplanar forces meeting at a point and their resultant $\overrightarrow{R} = (6\sqrt{2}, \frac{3}{4}\pi)$. Find the values of a and b .

(2) In the opposite figure :



Three forces of magnitudes 2F , 3F , 4F Newton act at the sides of an equilateral triangle ABC in the direction of $\overrightarrow{AB}$, $\overrightarrow{BC}$, $\overrightarrow{CA}$ respectively .
Find the magnitude and the direction of their resultant.

(3) Three coplanar forces are equal in magnitudes act on a particle, the magnitude of each is 40 Newton , the measure of the angle between the line of actions of first force and second force is 60°, the measure of the angle between the line of actions of second force and third force is 60° . Find the magnitude and the direction of their resultant .

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(4) Four coplanar forces meeting at a point of magnitudes F_1 , $17\sqrt{3}$, $14\sqrt{3}$, F_2 Newton act due to East, North, 30° north of the west, 60° south of the east respectively, if the magnitude of the resultant of them is 16 Newton and acts in the direction 60° north of the east.
Find the magnitude of F_1 and F_2 .

(5) ABCDEF is a regular hexagon . forces of magnitudes 4 , $8\sqrt{3}$, $4\sqrt{3}$, 8 Newton act in the direction $\overrightarrow{AB}$, $\overrightarrow{AC}$, $\overrightarrow{AE}$, $\overrightarrow{AF}$ respectively. Find the magnitude and the direction of the resultant of these forces .

(6) Six coplanar forces of magnitudes 5 , 4 , 7 , 3 , 6 , 5 Newton act on a particle, the measure of the angle between each two consecutive forces is 60° .
Find the resultant of these forces .

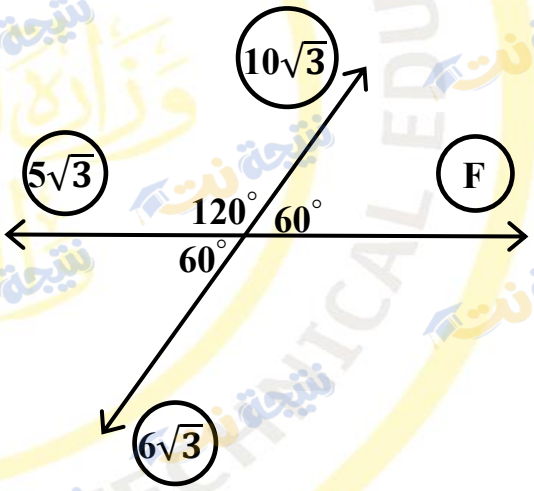
(7) ABCD is a rectangle where AB = 4 cm, BC = 3 cm, the forces of magnitude s 2 , 5 , 3 Newton act at point A in the directions of $\overrightarrow{AB}$, $\overrightarrow{AC}$, $\overrightarrow{AD}$ respectively.
Find the resultant of these forces.

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(8) ABCD is a square of side length 4 cm. , E $\in \overline{CD}$ where DE = 3 cm., the forces of magnitudes 2, $4\sqrt{2}$, 10, 4 Newton act at point A in the direction of $\overrightarrow{AB}$, $\overrightarrow{AC}$, $\overrightarrow{AE}$, $\overrightarrow{AD}$ respectively. Find the resultant of these forces.

(9) The forces $\overrightarrow{F_1} = 5\,\hat{i} - 4\,\hat{j}$, $\overrightarrow{F_2} = 9\,\hat{i} + 9\,\hat{j}$, $\overrightarrow{F_3} = -2\,\hat{i} + 4\,\hat{j}$ are three coplanar forces act on a particle. Find the measure of the angle between the resultant and the positive direction of x-axis .

(10) The opposite figure represents a set of forces meeting at a point ,if the magnitude of their resultant is $4\sqrt{3}$ N. Find the value of F .

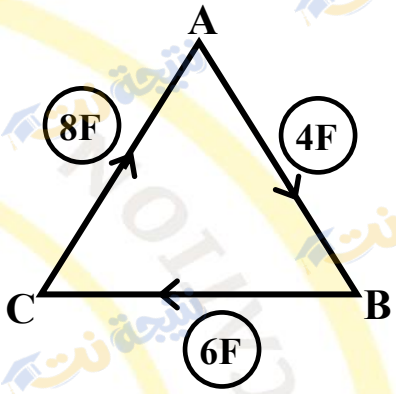


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Homework (Week Four) - Mathematics Applications

(1) If $\overrightarrow{F_1} = 6\,\hat{i} + 7\,\hat{j}$, $\overrightarrow{F_2} = a\,\hat{i} + b\,\hat{j}$, $\overrightarrow{F_3} = 3\,\hat{i} + 5\,\hat{j}$ are three coplanar forces meeting at a point and their resultant $\overrightarrow{R} = (4\ ,\ \pi)$. Find the values of a and b .

(2) In the opposite figure :



Three forces of magnitudes 4F , 6F , 8F Newton act at a point and parallel to the sides of an equilateral triangle ABC in the direction of $\overrightarrow{AB}$, $\overrightarrow{BC}$, $\overrightarrow{CA}$ respectively .
Find the magnitude and the direction of their resultant.

(3) Four coplanar forces meet at a point of magnitudes 5 , 10 , $15\sqrt{3}$, 20 Newton act on a particle, the measure of the angle between the first force and second force is 60° , the measure of the angle between the second force and third force is 90° and the measure of the angle between the third force and fourth force is 120°.
Find the magnitude and the direction of their resultant.

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(4) Four coplanar forces meet at a point of magnitudes F_1 , $6\sqrt{2}$, $8\sqrt{2}$, F_2 Newton act due to East , Eastern North , Western North , South respectively , if the magnitude of the resultant of them is 7 Newton and acts in the direction of east. Find the values of F_1 and F_2.

(5) ABCDEF is a regular hexagon , M is the point of intersection of its diagonals, forces of magnitudes 4 , 1 , 4 , 5 , 2 , 3 Newton act in the direction $\overrightarrow{MA}$, $\overrightarrow{MB}$, $\overrightarrow{MC}$, $\overrightarrow{MD}$, $\overrightarrow{ME}$, $\overrightarrow{MF}$ respectively. Find the magnitude and the direction of the resultant of these forces.

(6) Six coplanar forces of magnitudes 10, 8, 14, 6, 12, 10 Newton act on a particle, the measure of the angle between each two consecutive forces is 60°.
Find the resultant of these forces .

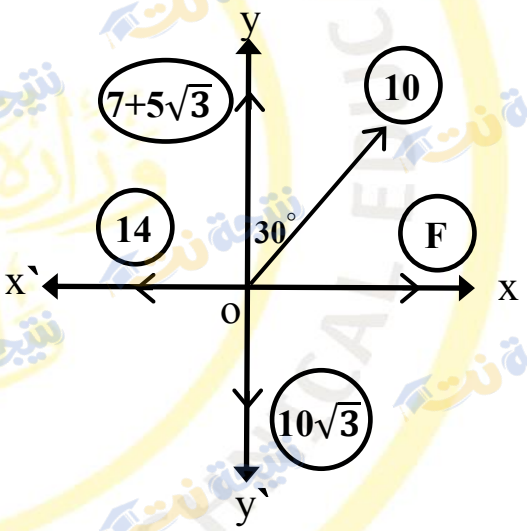
(7) ABCD is a rectangle where AB = 5 cm , BC = 12 cm , the forces of magnitudes 4, 10, 6 Newton act at point A in the direction of $\overrightarrow{AB}$, $\overrightarrow{AC}$, $\overrightarrow{AD}$ respectively.
Find the resultant of these forces.

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(8) ABCD is a square of side length 12 cm , E ∈ $\overline{CD}$ where BE = 5 cm., the forces of magnitudes 2, 13, $4\sqrt{2}$, 9 Newton act at point A in the direction of $\overrightarrow{AB}$, $\overrightarrow{AE}$, $\overrightarrow{CA}$, $\overrightarrow{AD}$ respectively . Find the resultant of these forces.

(9) The forces $\overrightarrow{F_1} = 13\,\hat{i} - 9\,\hat{j}$, $\overrightarrow{F_2} = 10\,\hat{i} + 5\,\hat{j}$, $\overrightarrow{F_3} = 6\,\hat{i} + 9\,\hat{j}$ are three coplanar forces act on a particle. Find the measure of the angle between the resultant and the positive direction of x-axis .

(10) The opposite figure represents a set of forces meeting at a point O ,if the magnitude of their resultant is 14 Newton. Find the value of F .



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Weekly Assessment (Week Four) - Mathematics Applications

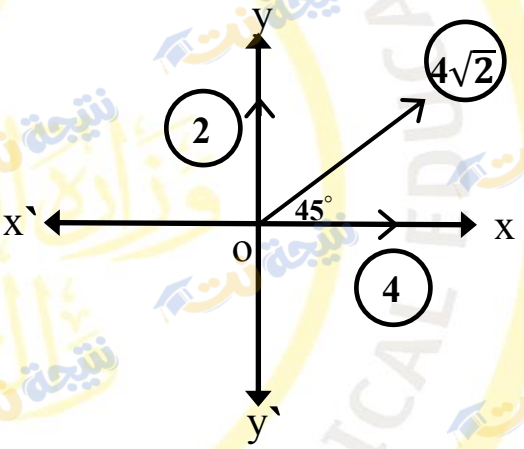
First Group

1) If $\overrightarrow{F_1} = 2\hat{i} - 2\hat{j}$, $\overrightarrow{F_2} = 4\hat{i} - 4\hat{j}$, are three coplanar forces meeting at a point and their resultant, $\overrightarrow{R} = 2a\hat{i} - 3b\hat{j}$.

Find the values of a and b .

2) Three coplanar forces meet at a point of magnitudes 85, 75, $50\sqrt{2}$ kg.wt., the first acts in the direction of East, the second acts in the direction 30° West of the North ,and the third acts in the direction Western south, find the magnitude and the direction of the resultant of them.

3) Find the magnitude and the direction of the resultant of the represented forces in the opposite figure.



4) Three coplanar forces of magnitudes F,$8\sqrt{3}$,8 Newton act on a particle and the measure of the angle between the second the third force is 150° . Find the value of F if the forces are in equilibrium .

5) Three coplanar forces of magnitudes 6, $6\sqrt{2}$, 6 Newton act on a particle Find the measure of the angle between the first force and the second force if the forces are in equilibrium .

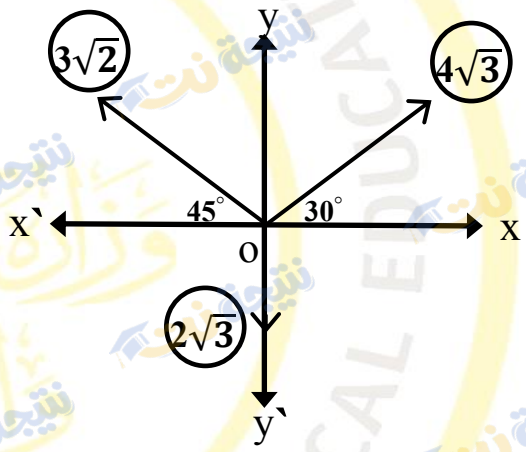
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Second Group

(1) If $\overrightarrow{F_1} = 3\hat{i} - 2\hat{j}$, $\overrightarrow{F_2} = a\hat{i} - \hat{j}$, $\overrightarrow{F_3} = 4\hat{i} - b\hat{j}$ are three coplanar forces meeting at a point and their resultant $\overrightarrow{R} = 6\hat{i} - 4\hat{j}$.
Find the values of a and b .

(2) Five coplanar forces meet at a point its magnitudes are 9 , 6 , $4\sqrt{2}$, $5\sqrt{2}$, 5 Newton and act due to the directions East, North, Western North , Western South , South respectively, prove that the forces in equilibrium.

(3) Find the magnitude and the direction of the resultant of the represented forces in the opposite figure.



(4) Three coplanar forces of magnitudes F, 6, 2.5 Newton act on a particle and the measure of the angle between the second force and the third force is 90°. Find the value of F if the forces are in equilibrium .

(5) Three coplanar forces of magnitudes 8, $8\sqrt{3}$, 8 Newton act on a particle Find the measure of the angle between the first force and the second force if the forces are in equilibrium .

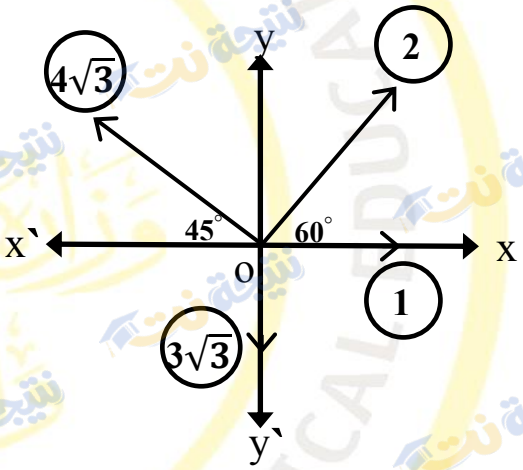
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Third Group

(1) If $\overrightarrow{F_1} = 2\,\hat{\imath}$, $\overrightarrow{F_2} = \hat{\imath} - 2\,\hat{\jmath}$, $\overrightarrow{F_3} = 6\,\hat{\jmath}$ are three coplanar forces meeting at a point and their resultant $\overrightarrow{R} = a\,\hat{\imath} + 2b\,\hat{\jmath}$ Find the values of a and b .

(2) Four coplanar forces meet at a point its magnitudes are 16, 4, $8\sqrt{3}$, $4\sqrt{3}$ Newton and act due to the directions East , 60° North of the East , 60° West of the South , South , respectively, prove that the forces in equilibrium.

(3) Find the magnitude and the direction of the resultant of the represented forces in the opposite figure.



(4) Three coplanar forces of magnitudes F, 6 , $6\sqrt{2}$ Newton act on a particle and the measure of the angle between the second force and the third force is 135°.find the value of F if the forces are in equilibrium .

(5) Three coplanar forces of magnitudes 6, 2.5 , 6.5Newton act on a particle Find the measure of the angle between the first force and the second force if the forces are in equilibrium .

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