



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

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

ونوجيهات رئيس الإدارة المركزية للتعليم العام
د / هالة عبد السلام خفاجي

إشراف علمي
مسنشار الرياضيات
أ / منال عزقول

إدعاءات و تقييمات لمنهج تطبيقات الرياضيات لفان

للصف الثاني الثانوي " علمي "
الفصل الدراسي الأول
للعام الدراسي 2026 / 2027

الأسبوع الرابع

لجنة الإعداد

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

ترجمة

أ / محمود سليمان نظيف

مراجعة الترجمة

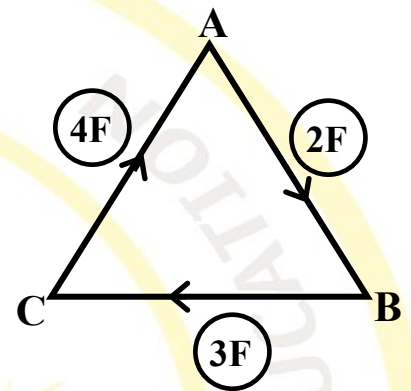
أ / شريف البرهامي أ / عمرو فاروق

Classroom Performance (Week Four) - Mathematics Applications

- (1) If $\vec{F}_1 = 3\hat{i} + 2\hat{j}$, $\vec{F}_2 = a\hat{i} + b\hat{j}$, $\vec{F}_3 = -12\hat{i} + 7\hat{j}$ are three coplanar forces meeting at a point and their resultant $\vec{R} = (6\sqrt{2}, \frac{3}{4}\pi)$. 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 $\vec{AB}$, $\vec{BC}$, $\vec{CA}$ respectively.



Find the magnitude and the direction of their resultant.

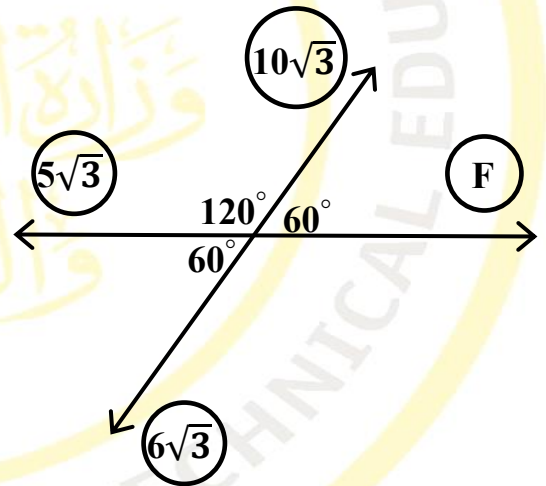
- (3) Three coplanar forces are equal in magnitudes act on a particle, the magnitude of each is 40 Newton, the measure of the angle between the line of actions of first force and second force is 60° , the measure of the angle between the line of actions of second force and third force is 60° . Find the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

- (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 magnitudes 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.

(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 .

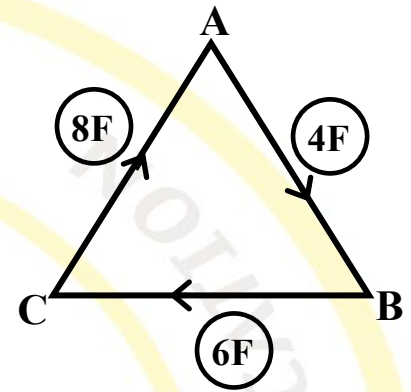


Homework (Week Four) - Mathematics Applications

- (1) If $\vec{F}_1 = 6\hat{i} + 7\hat{j}$, $\vec{F}_2 = a\hat{i} + b\hat{j}$, $\vec{F}_3 = 3\hat{i} + 5\hat{j}$ are three coplanar forces meeting at a point and their resultant $\vec{R} = (4, \pi)$. 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



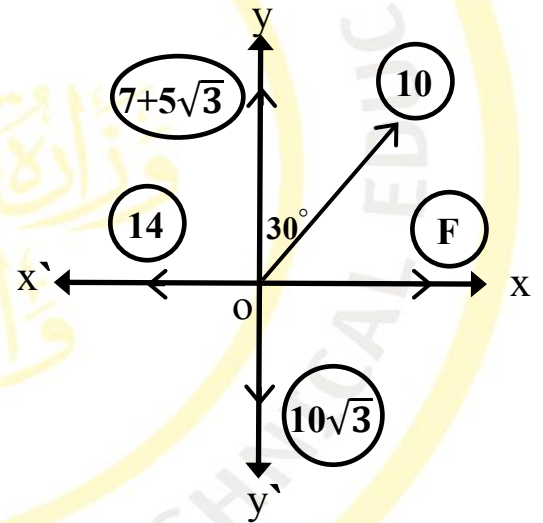
in the direction of $\vec{AB}$, $\vec{BC}$, $\vec{CA}$ respectively .

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.

- (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.

- (8) ABCD is a square of side length 12 cm , $E \in \overline{CD}$ 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 .



Weekly Assessment (Week Four) - Mathematics Applications

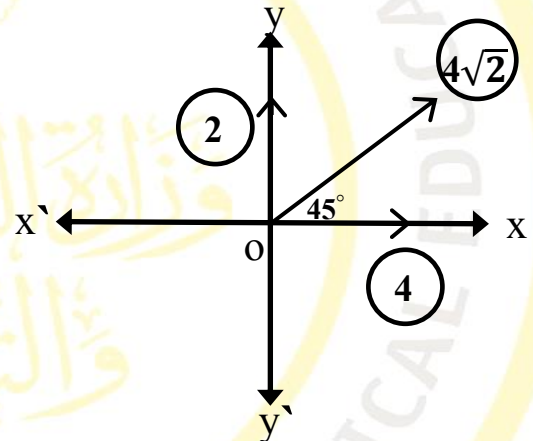
First Group

- 1) If $\vec{F}_1 = 2\hat{i} - 2\hat{j}$, $\vec{F}_2 = 4\hat{i} - 4\hat{j}$, are three coplanar forces meeting at a point and their resultant, $\vec{R} = 2a\hat{i} - 3b\hat{j}$.

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.

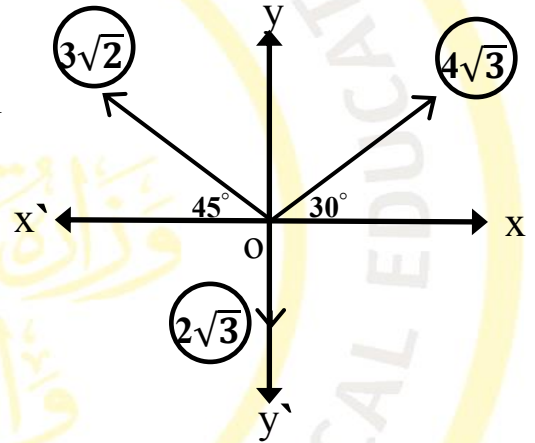
Second Group

- (1) If $\vec{F}_1 = 3\hat{i} - 2\hat{j}$, $\vec{F}_2 = a\hat{i} - \hat{j}$, $\vec{F}_3 = 4\hat{i} - b\hat{j}$ are three coplanar forces meeting at a point and their resultant $\vec{R} = 6\hat{i} - 4\hat{j}$.

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.



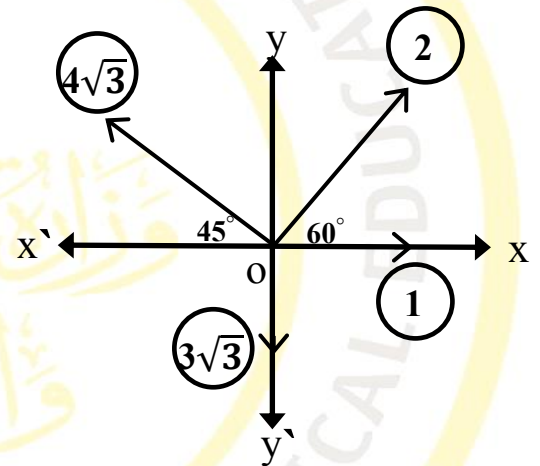
- (4) Three coplanar forces of magnitudes F , 6, 2.5 Newton act on a particle and the measure of the angle between the second force and the third force is 90° . Find the value of F if the forces are in equilibrium.
- (5) Three coplanar forces of magnitudes 8, $8\sqrt{3}$, 8 Newton act on a particle Find the measure of the angle between the first force and the second force if the forces are in equilibrium.

Third Group

- (1) If $\vec{F}_1 = 2\hat{i}$, $\vec{F}_2 = \hat{i} - 2\hat{j}$, $\vec{F}_3 = 6\hat{j}$ are three coplanar forces meeting at a point and their resultant $\vec{R} = a\hat{i} + 2b\hat{j}$ 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 , 6.5 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 .