

تجميعة قوانين الفصل الثاني منهج. ريفيل



تم تحميل هذا الملف من موقع المناهج الإماراتية

موقع المناهج ← المناهج الإماراتية ← الصف الحادي عشر المتقدم ← رياضيات ← الفصل الثاني ← ملفات متنوعة ← الملف

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المزيد من مادة
رياضيات:

إعداد: محمد زياد

التواصل الاجتماعي بحسب الصف الحادي عشر المتقدم



صفحة المناهج
الإماراتية على
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الرياضيات

اللغة الانجليزية

اللغة العربية

التربية الاسلامية

المواد على تلغرام

المزيد من الملفات بحسب الصف الحادي عشر المتقدم والمادة رياضيات في الفصل الثاني

حل ملخص وتوقعات أسئلة وزارية وفق الهيكل الوزاري منهج بريدج

1

ملخص وتوقعات أسئلة وزارية وفق الهيكل الوزاري منهج بريدج

2

تجميعة أسئلة الوحدة السابعة المتجهات وفق الهيكل الوزاري منهج بريدج

3

تجميعة أسئلة الوحدة السادسة وفق الهيكل الوزاري منهج بريدج

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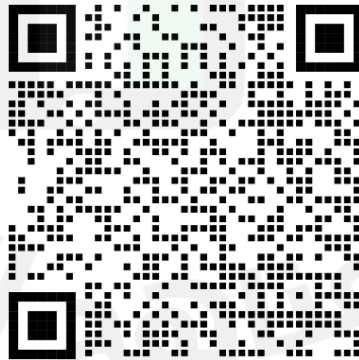
تجميعة أسئلة الوحدة الخامسة وفق الهيكل الوزاري منهج بريدج

5



قوانين الفصل الدراسي الثاني
الصف الحادي عشر REVEAL
منهج انجليزي (حكومي)

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CH11 Rules

Quotient Identities

$$\tan \theta = \frac{\sin \theta}{\cos \theta}$$

$$\cot \theta = \frac{\cos \theta}{\sin \theta}$$

Reciprocal Identities

$$\cot \theta = \frac{1}{\tan \theta}$$

$$\csc \theta = \frac{1}{\sin \theta}$$

$$\sec \theta = \frac{1}{\cos \theta}$$

Pythagorean Identities

$$\sin^2 \theta + \cos^2 \theta = 1$$

$$\tan^2 \theta + 1 = \sec^2 \theta$$

$$1 + \cot^2 \theta = \csc^2 \theta$$

Sum Identities Addition Formulas

$$\sin(a+b) = \sin a \cos b + \cos a \sin b$$

$$\cos(a+b) = \cos a \cos b - \sin a \sin b$$

$$\tan(a+b) = \frac{\tan a + \tan b}{1 - \tan a \tan b}$$

Difference Identities Subtraction Formulas

$$\sin(a-b) = \sin a \cos b - \cos a \sin b$$

$$\cos(a-b) = \cos a \cos b + \sin a \sin b$$

$$\tan(a-b) = \frac{\tan a - \tan b}{1 + \tan a \tan b}$$

Double Angle Formulas

$$\sin 2a = 2 \sin a \cos a$$

$$\cos 2a = \cos^2 a - \sin^2 a$$

$$= 2 \cos^2 a - 1$$

$$= 1 - 2 \sin^2 a$$

$$\tan 2a = \frac{2 \tan a}{1 - \tan^2 a}$$

Co-function Identities

$$\cos\left(\frac{\pi}{2} - \theta\right) = \sin \theta$$

$$\sin\left(\frac{\pi}{2} - \theta\right) = \cos \theta$$

$$\tan\left(\frac{\pi}{2} - \theta\right) = \cot \theta$$

Even-Odd Identities

$$\sin(-\theta) = -\sin \theta$$

$$\cos(-\theta) = \cos \theta$$

$$\tan(-\theta) = -\tan \theta$$

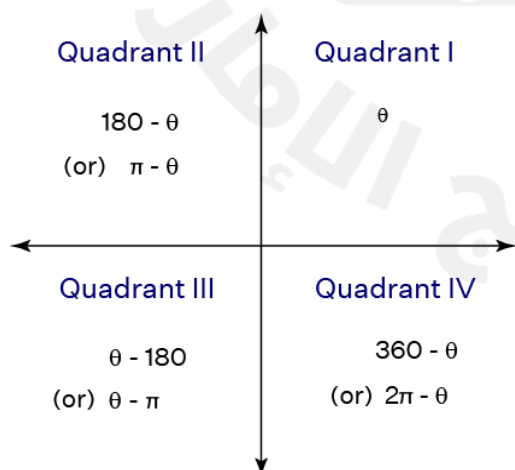
Half-Angle Formulas

$$\sin\left(\frac{\theta}{2}\right) = \pm \sqrt{\frac{1 - \cos \theta}{2}}$$

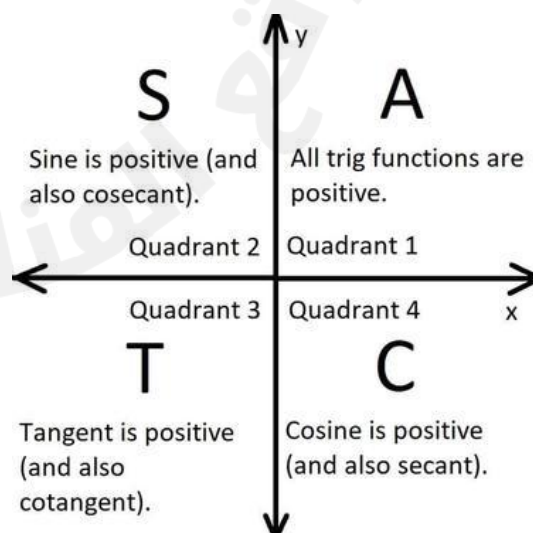
$$\cos\left(\frac{\theta}{2}\right) = \pm \sqrt{\frac{1 + \cos \theta}{2}}$$

$$\tan\left(\frac{\theta}{2}\right) = \pm \sqrt{\frac{1 - \cos \theta}{1 + \cos \theta}}$$

Reference Angle Formula



Trigonometric signs:



CH5 Rules

1) Let $A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$. A is invertible if and only if $ad - cb \neq 0$.

➔ $\det(A) = |A| = \begin{vmatrix} a & b \\ c & d \end{vmatrix} = ad - cb.$ $A^{-1} = \frac{1}{ad - cb} \begin{bmatrix} d & -b \\ -c & a \end{bmatrix}.$

2) Let $A = \begin{bmatrix} a & b & c \\ d & e & f \\ g & h & i \end{bmatrix}$. Then $\det(A) = |A| = a \begin{vmatrix} e & f \\ h & i \end{vmatrix} - b \begin{vmatrix} d & f \\ g & i \end{vmatrix} + c \begin{vmatrix} d & e \\ g & h \end{vmatrix}.$

KeyConcept Cramer's Rule

Let A be the coefficient matrix of a system of n linear equations in n variables given by $AX = B$. If $\det(A) \neq 0$, then the unique solution of the system is given by

$$x_1 = \frac{|A_1|}{|A|}, x_2 = \frac{|A_2|}{|A|}, x_3 = \frac{|A_3|}{|A|}, \dots, x_n = \frac{|A_n|}{|A|},$$

where A_i is obtained by replacing the i th column of A with the column of constant terms B . If $\det(A) = 0$, then $AX = B$ has either no solution or infinitely many solutions.



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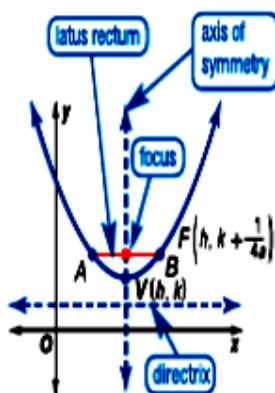
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CH6 Rules

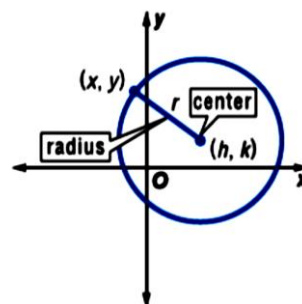
Parabola

Equation of parabolas		
Form	$y = a(x - h)^2 + k$	$x = a(y - k)^2 + h$
Direction of opening	$a > 0$ up	$a > 0$ right
	$a < 0$ down	$a < 0$ left
Vertex	(h, k)	(h, k)
Axis of symmetry	$x = h$	$y = k$
Focus	$(h, k + \frac{1}{4a})$	$(h + \frac{1}{4a}, k)$
Directrix	$y = k - \frac{1}{4a}$	$x = h - \frac{1}{4a}$
Length of latus rectum	$ \frac{1}{a} $	$ \frac{1}{a} $



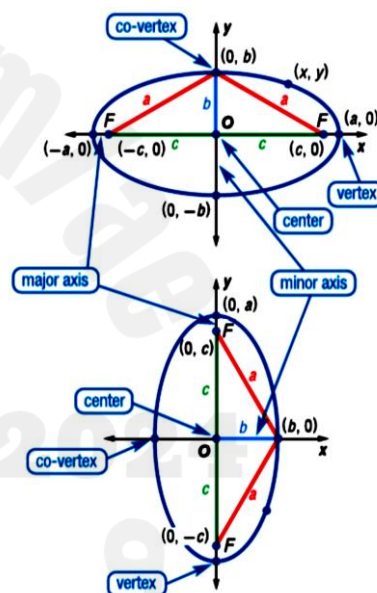
Circle

Standard Form of Equation	$(x - h)^2 + (y - k)^2 = r^2$
Center	(h, k)
Radius	r



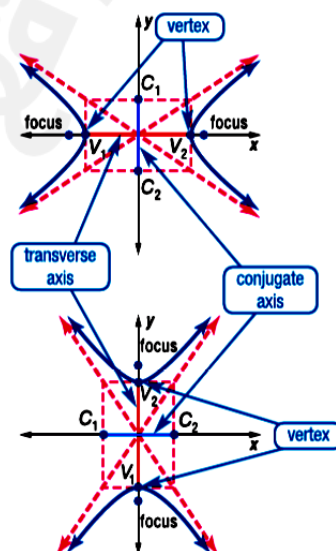
Ellipse

Standard form	$\frac{(x - h)^2}{a^2} + \frac{(y - k)^2}{b^2} = 1$	$\frac{(y - k)^2}{a^2} + \frac{(x - h)^2}{b^2} = 1$
Orientation	Horizontal	Vertical
Vertices	$(h \pm a, k)$	$(h, k \pm a)$
Foci	$(h \pm c, k)$	$(h, k \pm c)$
Co-Vertices	$(h, k \pm b)$	$(h \pm b, k)$
Length of major axis	$2a$	$2a$
Length of minor axis	$2b$	$2b$



Hyperbola

Standard form	$\frac{(x - h)^2}{a^2} - \frac{(y - k)^2}{b^2} = 1$	$\frac{(y - k)^2}{a^2} - \frac{(x - h)^2}{b^2} = 1$
Orientation	Horizontal	Vertical
Vertices	$(h \pm a, k)$	$(h, k \pm a)$
Foci	$(h \pm c, k)$	$(h, k \pm c)$
Co-Vertices	$(h, k \pm b)$	$(h \pm b, k)$
Length of Transverse axis	$2a$	$2a$
Length of Conjugate axis	$2b$	$2b$
Equations of asymptotes	$y - k = \pm \frac{b}{a}(x - h)$	$y - k = \pm \frac{a}{b}(x - h)$



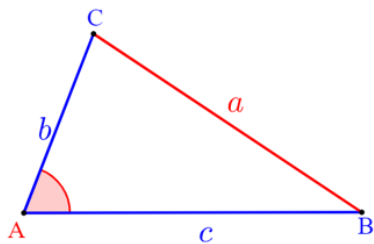
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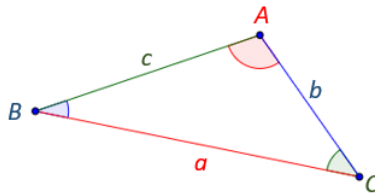
CH7 Rules

Cosine Rule



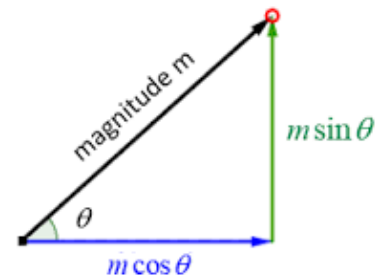
$$a^2 = b^2 + c^2 - 2bc \cos A$$

Sine Rule or Law of Sines



$$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$$

Components of a Vector



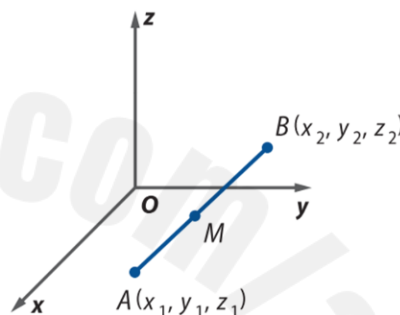
KeyConcept Distance and Midpoint Formulas in Space

The distance between points $A(x_1, y_1, z_1)$ and $B(x_2, y_2, z_2)$ is given by

$$AB = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2 + (z_2 - z_1)^2}$$

The midpoint M of \overline{AB} is given by

$$M\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}, \frac{z_1 + z_2}{2}\right)$$



KeyConcept Component Form of a Vector

The component form of a vector \overrightarrow{AB} with initial point $A(x_1, y_1)$ and terminal point $B(x_2, y_2)$ is given by

$$\langle x_2 - x_1, y_2 - y_1 \rangle$$

KeyConcept Magnitude of a Vector in the Coordinate Plane

If \mathbf{v} is a vector with initial point (x_1, y_1) and terminal point (x_2, y_2) , then the magnitude of \mathbf{v} is given by

$$|\mathbf{v}| = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

If \mathbf{v} has a component form of $\langle a, b \rangle$, then $|\mathbf{v}| = \sqrt{a^2 + b^2}$.

KeyConcept Vector Operations

If $\mathbf{a} = \langle a_1, a_2 \rangle$ and $\mathbf{b} = \langle b_1, b_2 \rangle$ are vectors and k is a scalar, then the following are true.

Vector Addition $\mathbf{a} + \mathbf{b} = \langle a_1 + b_1, a_2 + b_2 \rangle$

Vector Subtraction $\mathbf{a} - \mathbf{b} = \langle a_1 - b_1, a_2 - b_2 \rangle$

Scalar Multiplication $k\mathbf{a} = \langle ka_1, ka_2 \rangle$

$$\langle a, b, c \rangle = ai + bj + ck$$

2 Unit Vectors A vector that has a magnitude of 1 unit is called a **unit vector**. It is sometimes useful to describe a nonzero vector \mathbf{v} as a scalar multiple of a unit vector \mathbf{u} with the same direction as \mathbf{v} . To find \mathbf{u} , divide \mathbf{v} by its magnitude $|\mathbf{v}|$.

$$\mathbf{u} = \frac{\mathbf{v}}{|\mathbf{v}|} \quad \text{or} \quad \frac{1}{|\mathbf{v}|} \mathbf{v}$$

Direction of the vector:

To find the direction of a given vector $\langle a, b \rangle$

$$\theta = \tan^{-1}\left(\frac{b}{a}\right) \quad \text{if } a > 0 \quad \text{or} \quad \theta = \tan^{-1}\left(\frac{b}{a}\right) + 180^\circ, \quad \text{if } a < 0$$



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KeyConcept Dot Product of Vectors in a Plane

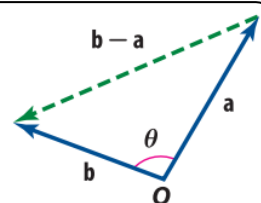
The dot product of $\mathbf{a} = \langle a_1, a_2 \rangle$ and $\mathbf{b} = \langle b_1, b_2 \rangle$ is defined as $\mathbf{a} \cdot \mathbf{b} = a_1 b_1 + a_2 b_2$.

KeyConcept Orthogonal Vectors

The vectors \mathbf{a} and \mathbf{b} are orthogonal if and only if $\mathbf{a} \cdot \mathbf{b} = 0$.

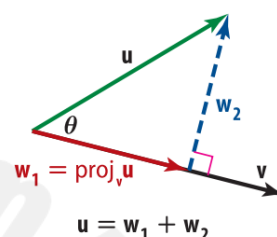
If θ is the angle between nonzero vectors \mathbf{a} and \mathbf{b} , then

$$\cos \theta = \frac{\mathbf{a} \cdot \mathbf{b}}{|\mathbf{a}| |\mathbf{b}|}$$

**KeyConcept** Projection of \mathbf{u} onto \mathbf{v}

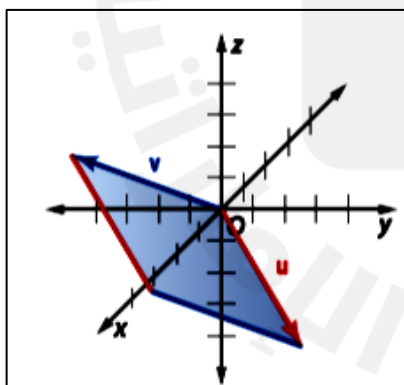
Let \mathbf{u} and \mathbf{v} be nonzero vectors, and let \mathbf{w}_1 and \mathbf{w}_2 be vector components of \mathbf{u} such that \mathbf{w}_1 is parallel to \mathbf{v} as shown. Then vector \mathbf{w}_1 is called the **vector projection** of \mathbf{u} onto \mathbf{v} , denoted $\text{proj}_{\mathbf{v}} \mathbf{u}$, and

$$\text{proj}_{\mathbf{v}} \mathbf{u} = \left(\frac{\mathbf{u} \cdot \mathbf{v}}{|\mathbf{v}|^2} \right) \mathbf{v}.$$

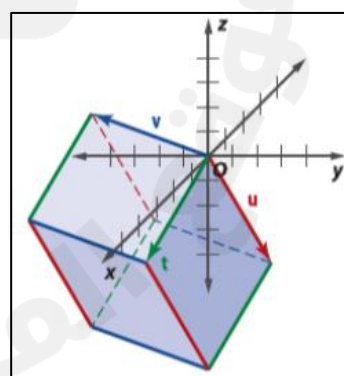


Work: $W = F \cdot d$, Where **f**: force , **d**: vector of displacement

Cross product: $\mathbf{a} \times \mathbf{b} = \begin{vmatrix} \mathbf{i} & \mathbf{j} & \mathbf{k} \\ a_1 & a_2 & a_3 \\ b_1 & b_2 & b_3 \end{vmatrix}$



$$\text{Area of Parallelogram} = |\mathbf{u} \times \mathbf{v}|$$



$$\text{Volume of parallelepiped} = t \cdot (\mathbf{u} \times \mathbf{v})$$



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