تدريبات على الهيكل الوزاري 2026 ريفيل

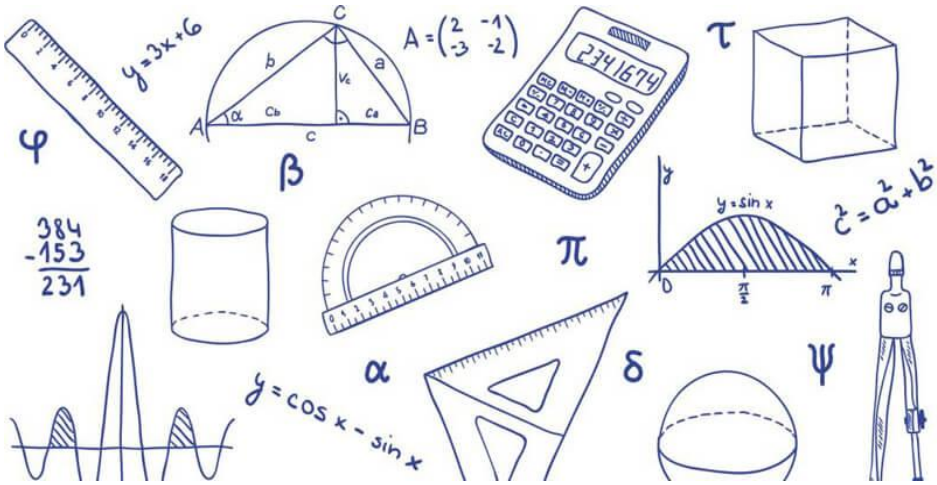
تم تحميل هذا الملف من موقع المناهج الإماراتية	
موقع المناهج ⇦ المناهج الإماراتية ⇦ الصف الثاني عشر العام ⇦ رياضيات ⇦ الفصل الثالث ⇦ ملفات متنوعة ⇦ الملف	
تاريخ إضافة الملف على موقع المناهج: 2026-05-21 00:32:53	
ملفات ا كتب للمعلم ا كتب للطالب ا اختبارات الكترونية ا اختبارات ا حلول ا عروض بوربوينت ا أوراق عمل منهج انجليزي ا ملخصات وتقارير ا مذكرات وبنوك ا الامتحان النهائي ا للمدرس	المزيد من مادة رياضيات:

التواصل الاجتماعي بحسب الصف الثاني عشر العام					
صفحة المناهج الإماراتية على فيسبوك					
المواد على تلغرام	التربية الاسلامية	اللغة العربية	اللغة الانجليزية	الرياضيات	

المزيد من الملفات بحسب الصف الثاني عشر العام والمادة رياضيات في الفصل الثالث	
1	أوراق عمل الوحدة السابعة Functions Rational والتاسعة Functions Trigonometric
2	حل اختبار شامل في الوحدة السابعة الدوال والعلاقات النسبية
3	اختبار شامل في الوحدة السابعة الدوال والعلاقات النسبية
4	مراجعة الوحدة السابعة functions Rational مع أسئلة امتحانات سابقة
5	مذكرة شاملة الوحدة العاشرة الدوال المثلثية

MATH 12 GEN

T3



Khaled alabdullah

almanahj.com/ae 2026 2025

Example 2 Simplify by Using −1

Simplify $\dfrac{(6x^2 - 5xy)(x + 2y)}{(x + y)(5y - 6x)}$.

Select the simplified form of $\dfrac{(7y - 3x)(5x - 1)}{(5x^3 + x^2)(3x - 7y)}$.

A. $-\dfrac{5x - 1}{x^2(5x + 1)}$

B. $\dfrac{(7y - 3x)(5x - 1)}{x^2(5x + 1)(3x - 7y)}$

C. $\dfrac{1}{x^2}$

D. $\dfrac{5x - 1}{5x^3 + x^2}$

almanahj.com/ae 2026 2025

Example 3 Multiply and Divide Rational Expressions

Simplify each expression.

a. $\frac{3x}{8y} \cdot \frac{12x^2y}{9xy^3}$

b. $\frac{10d^5}{6cd} \div \frac{30c^3d^2}{4c}$

almanahj.com/ae 2026 2025

Simplify $\dfrac{\dfrac{3x}{x-y}}{\dfrac{6xy}{4x^2-4y^2}}$.

Simplify $\dfrac{\dfrac{x^2-9y^2}{xy}}{\dfrac{2x+6y}{x^2}}$.

almanahj.com/ae 2026 2025

Simplify each expression.

a. $\frac{7a}{4b} + \frac{4c^2}{10}$

b. $\frac{2x}{9y} - \frac{7y}{6z}$

almanahj.com/ae 2026 2025

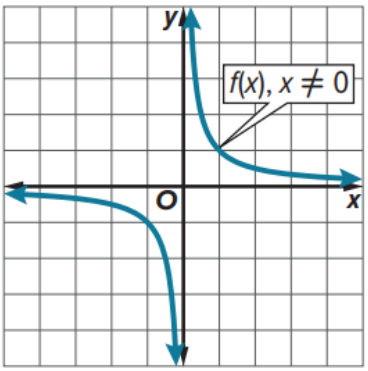
Simplify $\dfrac{2x+1}{x^2+2x-15} - \dfrac{7}{5x-15}$.

Simplify $\dfrac{3x}{4x^2+4} - \dfrac{2x^2}{x^4-1}$.

almanahj.com/ae 2026 2025

Key Concept • Reciprocal Functions

Parent function	$f(x) = \frac{1}{x}$
Type of graph	hyperbola
Domain and range	all nonzero real numbers
Asymptotes	$x = 0$ and $f(x) = 0$
Intercepts	none
Not defined	$x = 0$



7	تحديد خصائص دوال المقلوب	(1A,1B)	441		
	Determine properties of reciprocal functions.			(23,24)	334

Determine the values of x for which $f(x)$ is undefined.

23. $f(x) = \dfrac{2}{-2x + 5}$

24. $f(x) = \dfrac{-12}{-3x - 7}$

almanahj.com/ae 2026 2025

8	تمثيل تحويلات دوال المقلوب بيانيًا	مثال3	443		
	Graph transformations of reciprocal functions.			Example 4 & Check	331 & 332

Graph $g(x) = \frac{-4}{x+1} - 2$. State the domain and range.

Graph $g(x) = \frac{1}{x-1} + 3$.

almanahj.com/ae 2026 2025

Key Concept • Vertical and Horizontal Asymptotes

If $f(x) = \frac{a(x)}{b(x)}$, $a(x)$ and $b(x)$ are polynomial functions with no common factors other than 1, and $b(x) \neq 0$, then:

- $f(x)$ has a vertical asymptote whenever $b(x) = 0$.
- $f(x)$ has at most one horizontal asymptote.
  - If the degree of $a(x)$ is greater than the degree of $b(x)$, there is no horizontal asymptote.
  - If the degree of $a(x)$ is less than the degree of $b(x)$, the horizontal asymptote is the line $y = 0$.
  - If the degree of $a(x)$ equals the degree of $b(x)$, the horizontal asymptote is the line $y = \frac{\text{leading coefficient of } a(x)}{\text{leading coefficient of } b(x)}$.

almanahj.com/ae 2026 2025

10	تمثيل الدوال النسبية ذات خطوط التقارب الأفقية والرأسية بيانيًا	مثال 1	450		
	Graph rational functions with vertical and horizontal asymptotes.			Example 1	337 & 338

Example 1 Graph with No Horizontal Asymptotes

Graph $f(x) = \dfrac{x^3}{x + \frac{2}{3}}$.

Check

Consider $g(x) = \dfrac{(0.5x - 1)^3}{x}$.

Part A There is a zero at $x =$ ___?___.

Part B There is a vertical asymptote at $x =$ ___?___.

Part C Graph the function.

almanahj.com/ae 2026 2025

11	تمثيل الدوال النسبية ذات خط التقارب المائل ونقطة الانفصال بيانيًا	المفهوم الأساسي • خط التقارب المائل	451		
	Graph rational functions with oblique asymptotes and point discontinuity.			Key Concept • Oblique Asymptotes	340

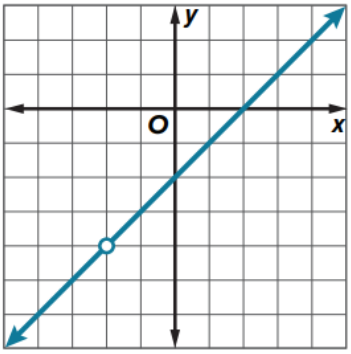
Key Concept • Oblique Asymptotes

If $f(x) = \frac{a(x)}{b(x)}$, where $a(x)$ and $b(x)$ are polynomial functions with no common factors other than 1 and $b(x) \neq 0$, then $f(x)$ has an oblique asymptote if the degree of $a(x)$ minus the degree of $b(x)$ equals 1. The equation of the asymptote is $f(x) = \frac{a(x)}{b(x)}$ with no remainder.

almanahj.com/ae 2026 2025

Example 5 Graph with Point Discontinuity

Graph $f(x) = \frac{x^2 - 4}{x + 2}$. Find the point discontinuity.



Notice that $\frac{x^2 - 4}{x + 2} = \frac{(x + 2)(x - 2)}{x + 2}$ or $x - 2$. However, because the denominator of the original function cannot be 0, there is a discontinuity at $x + 2 = 0$ or $x = -2$.

Therefore, the graph of $f(x) = \frac{x^2 - 4}{x + 2}$ is the graph of $f(x) = x - 2$ with a hole or point discontinuity at $x = -2$.

Consider $f(x) = \frac{(x+3)^2}{x+3}$. Find the point discontinuity. Then graph the function.

$f(x) = \frac{(x+3)^2}{x+3}$ has a point discontinuity at $x =$ ___?___.

13	حل المعادلات النسبية
	Solve rational equations .

Example 1 Solve a Rational Equation

Solve $\frac{7}{12} + \frac{9}{x-4} = \frac{55}{48}$.

Select the solution(s) of $\frac{5}{6} - \frac{2}{4x+1} = \frac{x}{3}$.

almanahj.com/ae 2026 2025

Example 2 Solve a Rational Equation with an Extraneous Solution

Solve $\frac{2m}{m-4} - \frac{m^2+7m+4}{3m^2-18m+24} = \frac{4m}{3m-6}$.

Solve $\frac{3x}{x-4} - \frac{x^2-7x-4}{x^2-16} = \frac{5}{x+4}$.

almanahj.com/ae 2026 2025

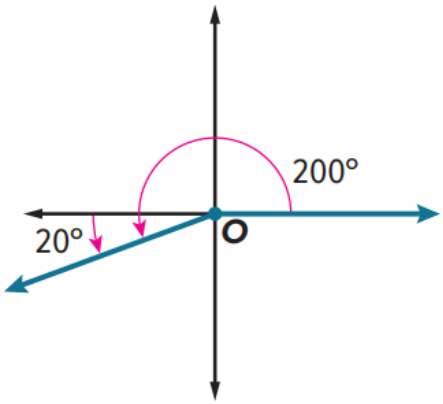
15	رسم الزوايا في وضع قياسي وإيجادها
	Draw and find angles in standard position.

Example 1 Draw an Angle in Standard Position

Draw an angle in standard position that measures 200°.

Because the measure of the angle is positive, rotate the terminal side counterclockwise.

The negative *x*-axis represents 180°. Because 200° = 180° + 20°, draw the terminal side 20° counterclockwise past the negative *x*-axis.

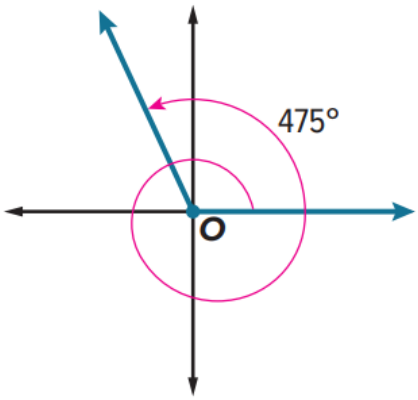


Example 2 Draw an Angle with More Than One Rotation

Draw an angle in standard position that measures 475°.

475° = 360° + 115°

The terminal side of the angle will make more than one rotation counterclockwise. First, make a full rotation starting at the positive *x*-axis. Continue the rotation. Draw the terminal side of the angle 115° counterclockwise past the positive *x*-axis.



Draw an angle in standard position that measures −400°.

Example 3 Identify Coterminal Angles

Find an angle with a positive measure and an angle with a negative measure that are coterminal with a 35° angle.

positive angle: $35° + 360° = 395°$

negative angle: $35° - 360° = -325°$

Check

Find an angle with a positive measure and an angle with a negative measure that are coterminal with a $-50°$ angle.

positive angle: ___?___°

negative angle: ___?___°

almanahj.com/ae 2026 2025

Example 4 Convert Degrees to Radians

Rewrite −100° in radians.

$$-100° = -100° \cdot \frac{\pi \text{ radians}}{180°}$$ Multiply by conversion factor.

$$= \frac{-100\pi}{180} \text{ or } -\frac{5\pi}{9} \text{ radians}$$ Simplify.

Check

Rewrite −220° in radians. Write the solution as a fraction in simplest form.

___?___ radians

Example 5 Convert Radians to Degrees

Rewrite $\frac{11\pi}{4}$ in degrees.

$$\frac{11\pi}{4} = \frac{11\pi}{4} \text{ radians} \cdot \frac{180°}{\pi \text{ radians}}$$ Multiply by conversion factor.

$$= \frac{11\cancel{\pi}}{4} \cancel{\text{radians}} \cdot \frac{180°}{\cancel{\pi \text{ radians}}}$$ Cancel units.

$$= \frac{1980°}{4} \text{ or } 495°$$ Simplify.

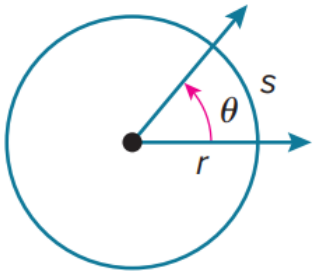
almanahj.com/ae 2026 2025

18	التحويل بين القياس بالدرجات والقياس بالراديان.
	Convert between degrees and radian measures and find arc lengths by using central angles.

Key Concept • Arc Length

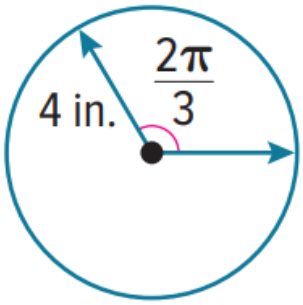
Words: For a circle with radius r and central angle θ (in radians), the arc length s equals the product of r and θ.

Symbols: $s = r\theta$

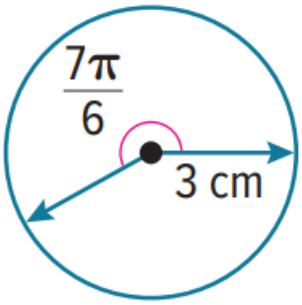


Find the length of each arc. Round to the nearest tenth.

63.

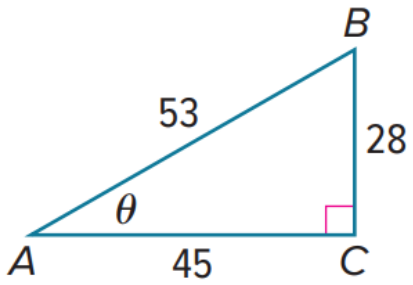


64.



Example 1 Evaluate Trigonometric Functions

Find the exact values of the six trigonometric functions for angle θ.



leg opposite θ: $BC = 28$

leg adjacent θ: $AC = 45$

hypotenuse: $AB = 53$

$\sin\theta = \frac{\text{opp}}{\text{hyp}} = \frac{28}{53}$

$\cos\theta = \frac{\text{adj}}{\text{hyp}} = \frac{45}{53}$

$\tan\theta = \frac{\text{opp}}{\text{adj}} = \frac{28}{45}$

$\csc\theta = \frac{\text{hyp}}{\text{opp}} = \frac{53}{28}$

$\sec\theta = \frac{\text{hyp}}{\text{adj}} = \frac{53}{45}$

$\cot\theta = \frac{\text{adj}}{\text{opp}} = \frac{45}{28}$

Find the exact values of the six trigonometric functions for angle θ.

$\sin\theta =$?

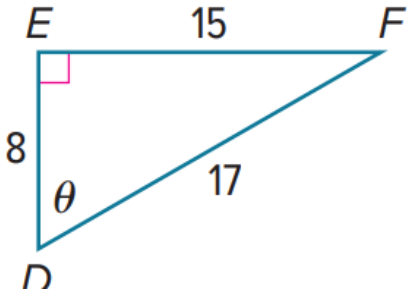
$\cos\theta =$?

$\tan\theta =$?

$\csc\theta =$?

$\sec\theta =$?

$\cot\theta =$?



almanahj.com/ae 2026 2025

20	إيجاد قيم النسب المثلثية
	Find values of trigonometric ratios.

Example 2 Find Trigonometric Ratios

If $\cos A = \frac{9}{13}$, find the exact values of the five remaining trigonometric functions for A.

If $\sec B = \frac{11}{3}$, find the exact values of the five remaining trigonometric functions for B.

almanahj.com/ae 2026 2025

Example 5 Find Reference Angles

Sketch each angle. Then find the measure of its reference angle.

a. 155°

b. $-\frac{8\pi}{3}$

Find the reference angle θ' of an angle that measures $\frac{23\pi}{6}$.

almanahj.com/ae 2026 2025

Example 6 Use a Reference Angle to Find a Trigonometric Value

Find the exact value of $\tan \frac{7\pi}{4}$.

Part A Find the measure of the reference angle.

The terminal side of $\frac{7\pi}{4}$ lies in Quadrant IV.

$\theta' = 2\pi - \theta$ — Find the reference angle θ'.

$= 2\pi - \frac{7\pi}{4}$ or $\frac{\pi}{4}$ — $\theta = \frac{7\pi}{4}$

Part B Use the reference angle to evaluate the function.

$\tan \frac{7\pi}{4} = -\tan \frac{\pi}{4}$ — The tangent function is negative in Quadrant IV.

$= -\tan 45°$ — $\frac{\pi}{4}$ radians $= 45°$

$= -1$ — $\tan 45° = 1$

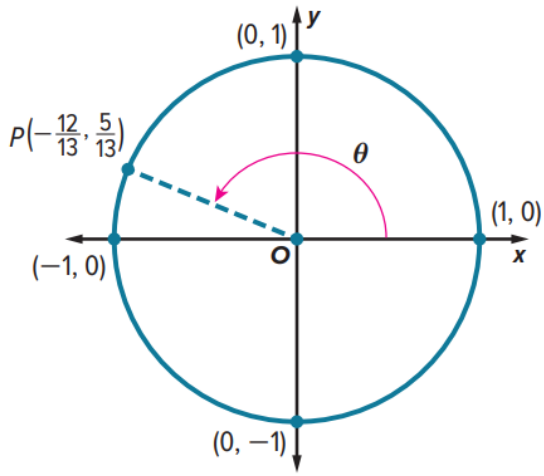
Check

Find the exact value of sec 225°.

almanahj.com/ae 2026 2025

Example 1 Find Sine and Cosine Given a Point on the Unit Circle

The terminal side of θ in standard position intersects the unit circle at $P\left(-\frac{12}{13}, \frac{5}{13}\right)$. Find cos θ and sin θ.



$P\left(-\frac{12}{13}, \frac{5}{13}\right) = P(\cos\theta, \sin\theta)$

$\cos\theta = -\frac{12}{13}$

$\sin\theta = \frac{5}{13}$

Check

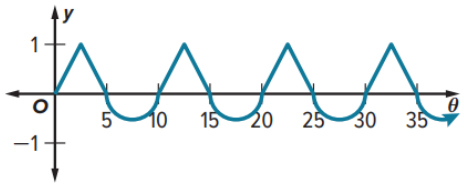
The terminal side of θ in standard position intersects the unit circle at $P\left(-\frac{4}{5}, -\frac{3}{5}\right)$. Find cos θ and sin θ. Write the solutions as decimals.

cos θ = ___?___ sin θ = ___?___

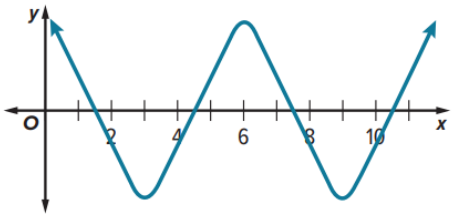
24	استخدام خصائص الدوال الدورية لإيجاد قيمة الدوال المثلثية
	Use the properties of periodic functions to evaluate trigonometric functions.

Determine the period of the function.

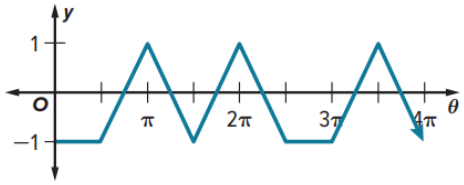
13.



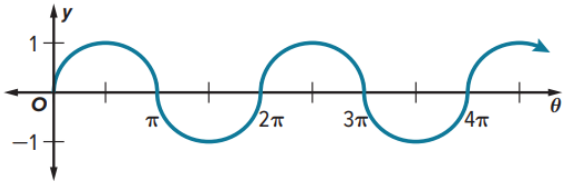
14.



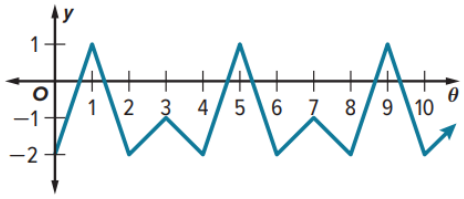
15.



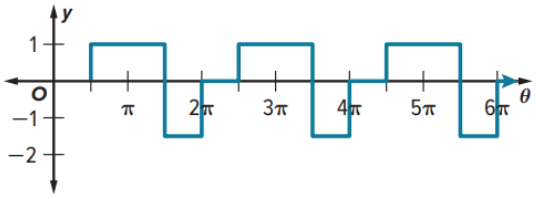
16.



17.



18.



Example 5 Evaluate Trigonometric Expressions

Find the exact value of $\cos \frac{10\pi}{3}$.

$\cos \frac{10\pi}{3} = \cos\left(\frac{4\pi}{3} + \frac{6\pi}{3}\right)$ $\qquad \frac{4\pi}{3} + \frac{6\pi}{3} = \frac{10\pi}{3}$

$= \cos \frac{4\pi}{3}$ $\qquad \cos(x + 2\pi) = \cos x$

$= -\frac{1}{2}$ $\qquad$ Use the unit circle.

Check

Find the exact value of each expression.

$\sin \frac{8\pi}{3} =$ ___?___

$\cos \frac{5\pi}{6} =$ ___?___

$\sin \frac{21\pi}{4} =$ ___?___

$\cos \frac{11\pi}{3} =$ ___?___

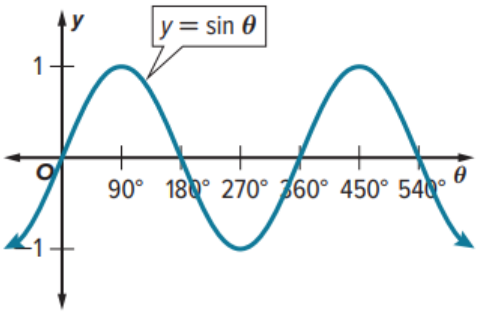
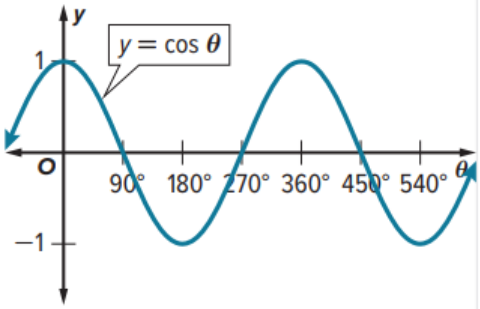
$\cos 60° =$ ___?___

$\sin 600° =$ ___?___

almanahj.com/ae 2026 2025

26	وصف دوال الجيب (sin) وجيب التمام (cos) والظل (tan) وتمثيلها بيانيا
	Describe and graph the sine, cosine, and tangent functions.

Key Concept • Sine and Cosine Functions

Parent	$y = \sin x$	$y = \cos x$
Graph		
Domain	all real numbers	all real numbers
Range	$\{y \mid -1 \le y \le 1\}$	$\{y \mid -1 \le y \le 1\}$
Amplitude	1	1
Midline	$y = 0$	$y = 0$
Period	360°	360°
Oscillation	between −1 and 1	between −1 and 1

27	وصف دوال الجيب (sin) وجيب التمام (cos) والظل (tan) وتمثيلها بيانيًا
	Describe and graph the sine, cosine, and tangent functions.

Find the amplitude and period of each function.

5. $y = 2\cos\theta$

6. $y = 2\sin\theta$

7. $y = \cos\frac{1}{2}\theta$

8. $y = \frac{3}{4}\cos\theta$

9. $y = \frac{1}{2}\sin 2\theta$

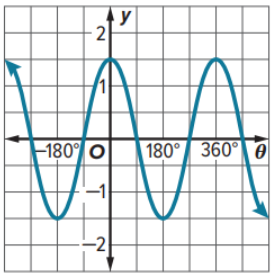
10. $y = 3\cos 2\theta$

almanahj.com/ae 2026 2025

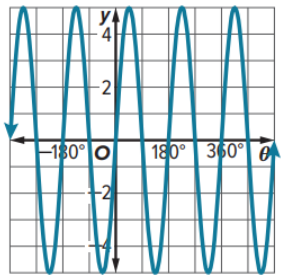
28	وصف دوال الجيب (sin) وجيب التمام (cos) والظل (tan) وتمثيلها بيانيا
	Describe and graph the sine, cosine, and tangent functions.

REGULARITY **For each graph, identify the period and write an equation.**

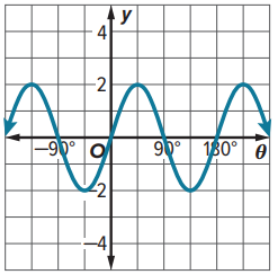
24.



25.



26.



29	وصف دوال الجيب (sin) وجيب التمام (cos) والظل (tan) وتمثيلها بيانيا
	Describe and graph the sine, cosine, and tangent functions.

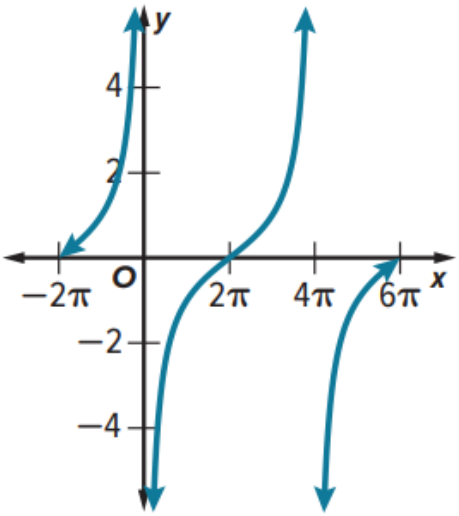
Example 1 Graph a Tangent Function with a Dilation

Find the period, asymptotes, *x*-intercepts, midline, and transformations of $y = \tan 3x$. Then graph the function.

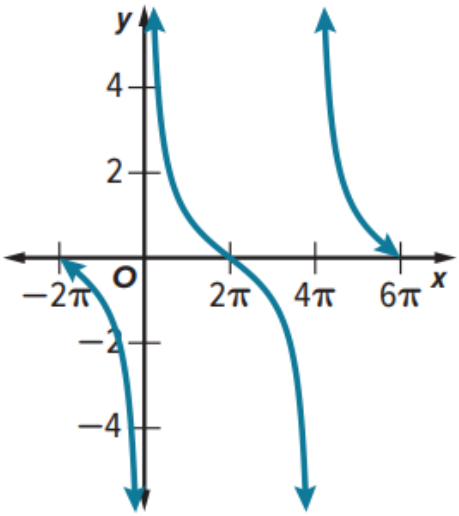
almanahj.com/ae 2026 2025

Part B Select the graph of $y = \tan 0.25x$.

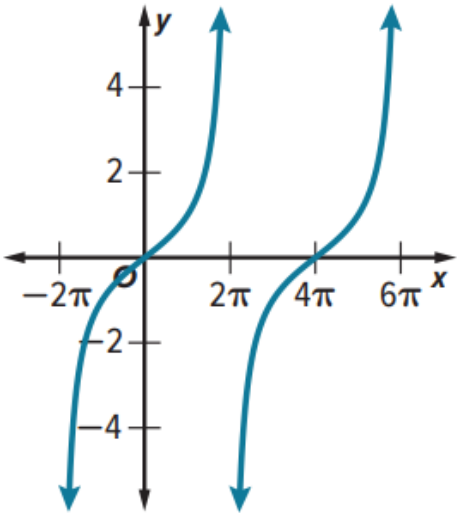
A.



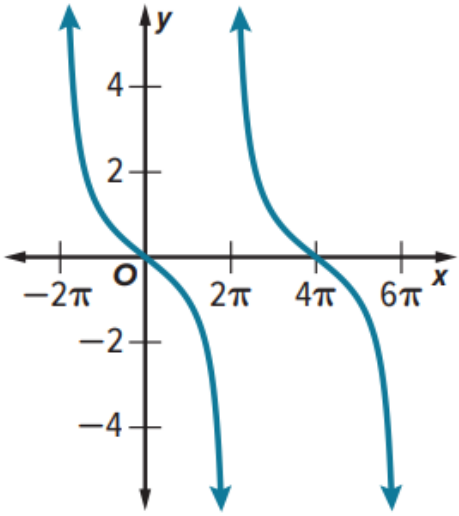
B.



C.

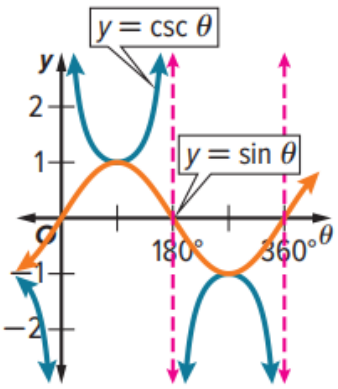
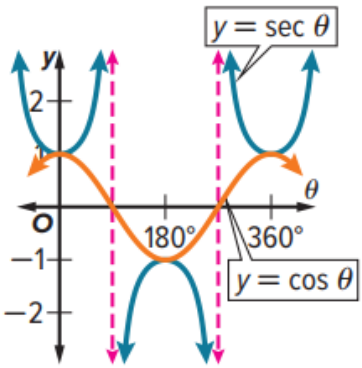
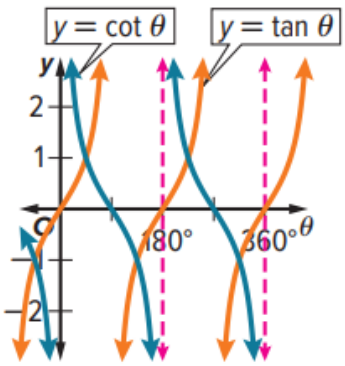


D.



30	وصف الدوال المثلثية غير دوال الجيب (sin) وجيب التمام (cos) والظل (tan) وتمثيلها بيانيًا
	Describe and graph trigonometric functions other than sine, cosine, and tangent.

Key Concept • Graphs of Reciprocal Functions

Parent Function		
$y = \csc x$	$y = \sec x$	$y = \cot x$
		
Domain		
$\{x \mid x \neq 180n°,$ n is an integer$\}$	$\{x \mid x \neq (90 + 180n)°,$ n is an integer$\}$	$\{x \mid x \neq 180n°,$ n is an integer$\}$
Range		
$\{y \mid y \leq -1$ or $y \geq 1\}$	$\{y \mid y \leq -1$ or $y \geq 1\}$	all real numbers
Amplitude		
undefined	undefined	undefined
Period		
360°	360°	180°
Midline		
$y = 0$	$y = 0$	$y = 0$