

#0 Alpha Cipheryng
FAMAT State Convention 2021

What is the period of the function

$$f(x) = \cos^4 x - \sin^4 x?$$

#0 Alpha Cipheryng
FAMAT State Convention 2021

What is the period of the function

$$f(x) = \cos^4 x - \sin^4 x?$$

#0 Alpha Cipheryng
FAMAT State Convention 2021

What is the period of the function

$$f(x) = \cos^4 x - \sin^4 x?$$

#0 Alpha Cipheryng
FAMAT State Convention 2021

What is the period of the function

$$f(x) = \cos^4 x - \sin^4 x?$$

#1 Alpha Ciphering
FAMAT State Convention 2021

Find all the values of k such that the equation:

$$\frac{3}{2 - \frac{1}{x}} = k, \text{ has no solution for } x.$$

#1 Alpha Ciphering
FAMAT State Convention 2021

Find all the values of k such that the equation:

$$\frac{3}{2 - \frac{1}{x}} = k, \text{ has no solution for } x.$$

#1 Alpha Ciphering
FAMAT State Convention 2021

Find all the values of k such that the equation:

$$\frac{3}{2 - \frac{1}{x}} = k, \text{ has no solution for } x.$$

#1 Alpha Ciphering
FAMAT State Convention 2021

Find all the values of k such that the equation:

$$\frac{3}{2 - \frac{1}{x}} = k, \text{ has no solution for } x.$$

#2 Alpha Ciphering
FAMAT State Convention 2021

Point F is on side \overline{LU} of triangle ZLU. If the measure of angles UZF and FZL both equal 60 degrees, ZU=3, and ZL=6, then what is the length of \overline{UF} ?

#2 Alpha Ciphering
FAMAT State Convention 2021

Point F is on side \overline{LU} of triangle ZLU. If the measure of angles UZF and FZL both equal 60 degrees, ZU=3, and ZL=6, then what is the length of \overline{UF} ?

#2 Alpha Ciphering
FAMAT State Convention 2021

Point F is on side \overline{LU} of triangle ZLU. If the measure of angles UZF and FZL both equal 60 degrees, ZU=3, and ZL=6, then what is the length of \overline{UF} ?

#2 Alpha Ciphering
FAMAT State Convention 2021

Point F is on side \overline{LU} of triangle ZLU. If the measure of angles UZF and FZL both equal 60 degrees, ZU=3, and ZL=6, then what is the length of \overline{UF} ?

#3 Alpha Ciphering
FAMAT State Convention 2021

$$\lim_{x \rightarrow 0} \frac{\sqrt[3]{8+x} - \sqrt[3]{8-x}}{2x} = ?$$

#3 Alpha Ciphering
FAMAT State Convention 2021

$$\lim_{x \rightarrow 0} \frac{\sqrt[3]{8+x} - \sqrt[3]{8-x}}{2x} = ?$$

#3 Alpha Ciphering
FAMAT State Convention 2021

$$\lim_{x \rightarrow 0} \frac{\sqrt[3]{8+x} - \sqrt[3]{8-x}}{2x} = ?$$

#3 Alpha Ciphering
FAMAT State Convention 2021

$$\lim_{x \rightarrow 0} \frac{\sqrt[3]{8+x} - \sqrt[3]{8-x}}{2x} = ?$$

#4 Alpha Ciphering
FAMAT State Convention 2021

Given the system:
$$\begin{array}{r} \frac{3M - 2U}{MU} = \frac{7}{12} \\ \frac{5M + 3U}{MU} = \frac{25}{4} \end{array}$$

What does MU=?

#4 Alpha Ciphering
FAMAT State Convention 2021

Given the system:
$$\begin{array}{r} \frac{3M - 2U}{MU} = \frac{7}{12} \\ \frac{5M + 3U}{MU} = \frac{25}{4} \end{array}$$

What does MU=?

#4 Alpha Ciphering
FAMAT State Convention 2021

Given the system:
$$\begin{array}{r} \frac{3M - 2U}{MU} = \frac{7}{12} \\ \frac{5M + 3U}{MU} = \frac{25}{4} \end{array}$$

What does MU=?

#4 Alpha Ciphering
FAMAT State Convention 2021

Given the system:
$$\begin{array}{r} \frac{3M - 2U}{MU} = \frac{7}{12} \\ \frac{5M + 3U}{MU} = \frac{25}{4} \end{array}$$

What does MU=?

#5 Alpha Ciphering**FAMAT State Convention 2021**

$f(k) = k^4 - 360k^2 + 400$ and $f(1)=41$. What other positive integer k makes $f(k)$ prime? Hint-Factor!

#5 Alpha Ciphering**FAMAT State Convention 2021**

$f(k) = k^4 - 360k^2 + 400$ and $f(1)=41$. What other positive integer k makes $f(k)$ prime? Hint-Factor!

#5 Alpha Ciphering**FAMAT State Convention 2021**

$f(k) = k^4 - 360k^2 + 400$ and $f(1)=41$. What other positive integer k makes $f(k)$ prime? Hint-Factor!

#5 Alpha Ciphering**FAMAT State Convention 2021**

$f(k) = k^4 - 360k^2 + 400$ and $f(1)=41$. What other positive integer k makes $f(k)$ prime? Hint-Factor!

#6 Alpha Ciphering
FAMAT State Convention 2021

You are given the sequence $\frac{1}{2}, 1, \frac{-3}{2}, 2, \frac{5}{2}, -3, \dots$,

where every third term is negative, and the absolute value of the terms form an arithmetic sequence. What is the sum of the first 303 terms?

#6 Alpha Ciphering
FAMAT State Convention 2021

You are given the sequence $\frac{1}{2}, 1, \frac{-3}{2}, 2, \frac{5}{2}, -3, \dots$,

where every third term is negative, and the absolute value of the terms form an arithmetic sequence. What is the sum of the first 303 terms?

#6 Alpha Ciphering
FAMAT State Convention 2021

You are given the sequence $\frac{1}{2}, 1, \frac{-3}{2}, 2, \frac{5}{2}, -3, \dots$,

where every third term is negative, and the absolute value of the terms form an arithmetic sequence. What is the sum of the first 303 terms?

#6 Alpha Ciphering
FAMAT State Convention 2021

You are given the sequence $\frac{1}{2}, 1, \frac{-3}{2}, 2, \frac{5}{2}, -3, \dots$,

where every third term is negative, and the absolute value of the terms form an arithmetic sequence. What is the sum of the first 303 terms?

#7 Alpha Ciphering

FAMAT State Convention 2021

Beavis flips 5 fair coins and his friend(Snowman) flips 2 fair coins. What is the probability that Snowman has more heads showing than Beavis?

#7 Alpha Ciphering

FAMAT State Convention 2021

Beavis flips 5 fair coins and his friend(Snowman) flips 2 fair coins. What is the probability that Snowman has more heads showing than Beavis?

#7 Alpha Ciphering

FAMAT State Convention 2021

Beavis flips 5 fair coins and his friend(Snowman) flips 2 fair coins. What is the probability that Snowman has more heads showing than Beavis?

#7 Alpha Ciphering

FAMAT State Convention 2021

Beavis flips 5 fair coins and his friend(Snowman) flips 2 fair coins. What is the probability that Snowman has more heads showing than Beavis?

#8 Alpha Ciphering

FAMAT State Convention 2021

Find the number of positive integers greater than 1 whose fourth powers are factors of 11!

#8 Alpha Ciphering

FAMAT State Convention 2021

Find the number of positive integers greater than 1 whose fourth powers are factors of 11!

#8 Alpha Ciphering

FAMAT State Convention 2021

Find the number of positive integers greater than 1 whose fourth powers are factors of 11!

#8 Alpha Ciphering

FAMAT State Convention 2021

Find the number of positive integers greater than 1 whose fourth powers are factors of 11!

#9 Alpha Ciphering
FAMAT State Convention 2021

In the complex plane, a square is centered at the origin with side length $5\sqrt{2}$. The sides of the square are parallel to the coordinate axes with vertices z_1, z_2, z_3 and z_4 . What does $z_1 z_2 z_3 z_4 = ?$

#9 Alpha Ciphering
FAMAT State Convention 2021

In the complex plane, a square is centered at the origin with side length $5\sqrt{2}$. The sides of the square are parallel to the coordinate axes with vertices z_1, z_2, z_3 and z_4 . What does $z_1 z_2 z_3 z_4 = ?$

#9 Alpha Ciphering
FAMAT State Convention 2021

In the complex plane, a square is centered at the origin with side length $5\sqrt{2}$. The sides of the square are parallel to the coordinate axes with vertices z_1, z_2, z_3 and z_4 . What does $z_1 z_2 z_3 z_4 = ?$

#9 Alpha Ciphering
FAMAT State Convention 2021

In the complex plane, a square is centered at the origin with side length $5\sqrt{2}$. The sides of the square are parallel to the coordinate axes with vertices z_1, z_2, z_3 and z_4 . What does $z_1 z_2 z_3 z_4 = ?$

#10 Alpha Ciphering
FAMAT State Convention 2021

What is the area of the triangle formed by the foci and any endpoint of either latus rectum for the following conic? $4x^2 - y^2 + 32x - 10y + 35 = 0$

#10 Alpha Ciphering
FAMAT State Convention 2021

What is the area of the triangle formed by the foci and any endpoint of either latus rectum for the following conic? $4x^2 - y^2 + 32x - 10y + 35 = 0$

#10 Alpha Ciphering
FAMAT State Convention 2021

What is the area of the triangle formed by the foci and any endpoint of either latus rectum for the following conic? $4x^2 - y^2 + 32x - 10y + 35 = 0$

#10 Alpha Ciphering
FAMAT State Convention 2021

What is the area of the triangle formed by the foci and any endpoint of either latus rectum for the following conic? $4x^2 - y^2 + 32x - 10y + 35 = 0$

