Lightning round notes

- Runner should change every 20 minutes exercise is good for all!
- Runner always sets off to the back of their column of teams FIRST.
- Correct attempt 1=3 points. Correct attempt 2=2 points. 1 point thereafter.
- Teams may pass after at least 3 attempts, that question cannot then be returned to.
- To determine rank when final points are tied, the number of passes is considered.
- Remember to use your formula sheet.
- WRITE YOUR TEAM NAME HERE:





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Practice : If it takes 60 musicians 15 minute song?	es to play a song, how long does it take 20 musicians to play the same
Answer:	
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Answer:	

1.	
A closed, right circular cone has height 12 and base radius 5. Find the perimeter of the net of the cone.	
	125Me
Answer:	
1.	
A closed, right circular cone has height 12 and base radius 5. Find the perimeter of the net of the cone.	
	SE STEP
Answer:	
1.	
A closed, right circular cone has height 12 and base radius 5. Find the perimeter of the net of the cone.	
	6 H S 1 1 1
	N25M€
Answer:	
Allono	

Given that $x=2025^2-2023^2$, find the value of $\dfrac{45\sqrt{x+4}}{2}$.





Answer:

2.

Given that $x=2025^2-2023^2$, find the value of $\dfrac{45\sqrt{x+4}}{2}$.





Answer:

2.

Given that $x=2025^2-2023^2$, find the value of $\dfrac{45\sqrt{x+4}}{2}$.





3.	
Jenny has 12 different pairs of shoes. In how form a pair?	many ways can she choose a right shoe and a left shoe that do NOT
Answer:	
3.	
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Answer:	
3.	
Jenny has 12 different pairs of shoes. In how form a pair?	many ways can she choose a right shoe and a left shoe that do NOT
Answer:	

4.	
	aining pens in the pouch are blue. Sophie Germaine takes two pens at she has two orange pens is $\frac{1}{3}$. Find the original number of blue pens
in the pouch.	3
A =	
Answer:	
4.	
	aining pens in the pouch are blue. Sophie Germaine takes two pens
	at she has two orange pens is $\frac{1}{3}$. Find the original number of blue pens
in the pouch.	
Answer:	
4.	
Six pens in a pouch are orange, all of the rem	aining pens in the pouch are blue. Sophie Germaine takes two pens
	at she has two orange pens is $\frac{1}{3}$. Find the original number of blue pens
in the pouch.	U
Answer:	

5.	
If a positive factor of 2025 is selected at random, what is the probability that it is less than 30?	
	125Mg
Answer:	
_	
5. If a positive factor of 2025 is calcated at random, what is the probability that it is loss than 302	
If a positive factor of 2025 is selected at random, what is the probability that it is less than 30?	
Answer:	
5.	
If a positive factor of 2025 is selected at random, what is the probability that it is less than 30?	
	S S S S S S S S S S S S S S S S S S S
Anguage	
Answer:	

Evaluate
$$\left(rac{1-i}{1+i}
ight)^{2025}$$

125Me



Answer:

6.

Evaluate
$$\left(rac{1-i}{1+i}
ight)^{2025}$$





Answer:

6.

Evaluate
$$\left(rac{1-i}{1+i}
ight)^{2025}$$





7.	
When the decimal number $2025!$ is written in base 6, find the number of trailing zeroes that it has.	
	House
	\$25M8
Answer:	
7.	
When the decimal number $2025!$ is written in base 6, find the number of trailing zeroes that it has.	
	H
	125 Me
Answer:	
7.	
When the decimal number $2025!$ is written in base 6, find the number of trailing zeroes that it has.	
	125M8
Answer:	

	_	_			
ľ	5		Ľ		
•	Ų	4	,	•	,

The remainder when the polynomial $y=x^3+ax^2-5x+3$ is divided by (x-2) is three times the remainder when the same polynomial is divided by (x+1). Find the value of a.





Answer:

8.

The remainder when the polynomial $y = x^3 + ax^2 - 5x + 3$ is divided by (x - 2) is three times the remainder when the same polynomial is divided by (x + 1). Find the value of a.





Answer:

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Suppose f(x) = f(x-1) + f(x+1) for all x.

If $f(0)=5 \hspace{0.1cm} ext{and} \hspace{0.1cm} f(1)=7$, find the value of f(2024)+f(1024)+f(24) .





Answer:

9.

Suppose f(x) = f(x-1) + f(x+1) for all x.

If f(0) = 5 and f(1) = 7, find the value of f(2024) + f(1024) + f(24).





Answer:

9.

Suppose f(x) = f(x-1) + f(x+1) for all x.

If f(0) = 5 and f(1) = 7, find the value of f(2024) + f(1024) + f(24).





4	^

The equation $2x^3+3x^2+5x+2=0$ has 1 real and 2 non-real roots. Find the sum of the 2 non-real roots.





Answer:

10.

The equation $2x^3+3x^2+5x+2=0$ has 1 real and 2 non-real roots. Find the sum of the 2 non-real roots.





Answer:

10.

The equation $2x^3+3x^2+5x+2=0$ has 1 real and 2 non-real roots. Find the sum of the 2 non-real roots.





4	1	

Find the area of a parallelogram whose diagonals are given by the vectors $\begin{bmatrix} 20 \\ -24 \end{bmatrix}$ and $\begin{bmatrix} 13 \\ 21 \end{bmatrix}$.



Answer:

11.

Find the area of a parallelogram whose diagonals are given by the vectors $\begin{bmatrix} 20 \\ -24 \end{bmatrix}$ and $\begin{bmatrix} 13 \\ 21 \end{bmatrix}$.





Answer:

11.

Find the area of a parallelogram whose diagonals are given by the vectors $\begin{bmatrix} 20 \\ -24 \end{bmatrix}$ and $\begin{bmatrix} 13 \\ 21 \end{bmatrix}$.





Simplify
$$\left(rac{-1+i\sqrt{3}}{2}
ight)^6+\left(rac{-1-i\sqrt{3}}{2}
ight)^6$$
 .

Write your answer in the form a+bi.

125Me



Answer:

12.

Simplify
$$\left(rac{-1+i\sqrt{3}}{2}
ight)^6+\left(rac{-1-i\sqrt{3}}{2}
ight)^6$$

Write your answer in the form a+bi.





Answer:

12.

Simplify
$$\left(rac{-1+i\sqrt{3}}{2}
ight)^6+\left(rac{-1-i\sqrt{3}}{2}
ight)^6$$
 ,

Write your answer in the form a+bi.





13.		
From the alphametic CLOCK+TICK+TOCK=PL	_ANET, find the value of K.	
Note: Each letter is represented by a distinct	t single-digit number, 0-9 inclusive.	
		6.45×**
		N25M®/
A		
Answer:		
13.		
From the alphametic CLOCK+TICK+TOCK=PL	_ANET, find the value of K.	
Note: Each letter is represented by a distinct	t single-digit number, 0-9 inclusive.	
		TEST STORY
Answer:		
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Note: Each letter is represented by a distinct	t single-digit number, 0-9 inclusive.	
		Honn
		725M®
Answer:		

Solve for $x \in \mathbb{R}$

$$\left(1+rac{1}{x}
ight)^{x+1}=\left(1+rac{1}{2024}
ight)^{2024}$$

125 Mg



Answer:

14.

Solve for $x \in \mathbb{R}$

$$\left(1+rac{1}{x}
ight)^{x+1}=\left(1+rac{1}{2024}
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Answer:

14.

Solve for $x \in \mathbb{R}$

$$\left(1+rac{1}{x}
ight)^{x+1}=\left(1+rac{1}{2024}
ight)^{2024}$$





15.	
Determine the smallest positive integer that c as the sum of 8 consecutive positive integers.	an be written as both the sum of 7 consecutive positive integers and
Answer:	
15.	
Determine the smallest positive integer that c as the sum of 8 consecutive positive integers.	an be written as both the sum of 7 consecutive positive integers and
Answer:	
Allswer.	
15 .	
Determine the smallest positive integer that c as the sum of 8 consecutive positive integers.	an be written as both the sum of 7 consecutive positive integers and
Answer:	
PARSON	

In photography, d is the distance of an object from a lens, the distance D of the image from the lens and the focal length of the lens f are related through the following formula: $\frac{1}{d} + \frac{1}{D} = \frac{1}{f}$.

For each lens, f is a constant whereas d and D are variables. In a particular instant, a racing car is moving away from the lens at a rate of $250kmh^{-1}$, in which direction and how fast, in kmh^{-1} , will the image be moving?





Answer:

16.

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Answer: 77. Find the number of ways that four distinct positive integers can sum to twenty. Answer: 77. Find the number of ways that four distinct positive integers can sum to twenty. 77. The find the number of ways that four distinct positive integers can sum to twenty.	17.	
17. Find the number of ways that four distinct positive integers can sum to twenty. Answer: 17. Find the number of ways that four distinct positive integers can sum to twenty.	Find the number of ways that four distinct positive integers can sum to twenty.	
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		245
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Answer:	Answer:	

1	0	
ı	O	ı,

Find the maximum value of $\dfrac{\sin^3(x)\cos(x)}{\tan^2(x)+1}$.





Answer:

18.

Find the maximum value of $\dfrac{\sin^3(x) \cos(x)}{\tan^2(x) + 1}$.





Answer:

18.

Find the maximum value of $\dfrac{\sin^3(x) \cos(x)}{\tan^2(x) + 1}$.





Find the maximum value of $f(x)=rac{x+1}{x^2+1}.$



Answer:

19.

Find the maximum value of $f(x)=rac{x+1}{x^2+1}$.





Answer:

19.

Find the maximum value of $f(x)=rac{x+1}{x^2+1}$.





The curves $f(x)=x^3+2x^2-3x-4$ and $g(x)=x^2+bx+c$ are tangent at x=-1 .

Find the value of b+c.





Answer:

20.

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Answer:

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Find the value of b+c.





21.	
Find the smallest integer with exactly six positive divisors, and has units digit 5.	
	(25 Me)
Answer:	
21.	
Find the smallest integer with exactly six positive divisors, and has units digit 5.	
	To be stated to the state of th
Answer:	IV
Allswer:	
21.	
Find the smallest integer with exactly six positive divisors, and has units digit 5.	
	\$25Me
Answer:	
PARSITO :	

22. Evaluate
$$\lim_{x \to +\infty} x \ln \left(1 + \frac{3}{x}\right)$$
.





Answer:

22. Evaluate
$$\lim_{x \to +\infty} x \ln \left(1 + \frac{3}{x}\right)$$
.





22. Evaluate
$$\lim_{x \to +\infty} x \ln \left(1 + \frac{3}{x}\right)$$
.





$$f(x) = ax^2 + bx + c$$

$$a,b,c\in\mathbb{Z}$$

Given that
$$f(x-1)+f(x)+f(x+2)=6x^2+13x-51$$
, find the value of $f(1)-f(-1)$.





Answer:

23.

$$f(x) = ax^2 + bx + c$$

$$a,b,c\in\mathbb{Z}$$

Given that $f(x-1)+f(x)+f(x+2)=6x^2+13x-51$, find the value of f(1)-f(-1).





Answer:

23.

$$f(x) = ax^2 + bx + c$$

$$a,b,c\in\mathbb{Z}$$

Given that $f(x-1)+f(x)+f(x+2)=6x^2+13x-51$, find the value of f(1)-f(-1).





 $a,b,c ext{ and } d$ are positive integers such that $\log_a(b)=rac{3}{2}$ and $\log_c(d)=rac{5}{4}.$

Given that a-c=9 , find the value of b-d .





Answer:

24.

 $a,b,c ext{ and } d$ are positive integers such that $\log_a(b)=rac{3}{2}$ and $\log_c(d)=rac{5}{4}.$

Given that a-c=9, find the value of b-d.





Answer:

24.

 $a,b,c ext{ and } d$ are positive integers such that $\log_a(b)=rac{3}{2}$ and $\log_c(d)=rac{5}{4}.$

Given that a-c=9, find the value of b-d.





Consider the polynomial $3x^4-9x^3+rx^2-10x+5=0$, $r\in\mathbb{R}$.

The product of its real roots is $\mathbf{1}$, find the sum of its real roots.

(25 Me)



Answer:

25.

Consider the polynomial $3x^4-9x^3+rx^2-10x+5=0$, $r\in\mathbb{R}.$

The product of its real roots is 1, find the sum of its real roots.





Answer:

25.

Consider the polynomial $3x^4-9x^3+rx^2-10x+5=0$, $r\in\mathbb{R}$.

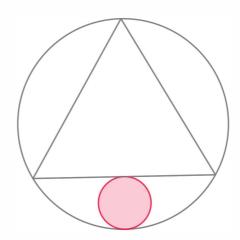
The product of its real roots is 1, find the sum of its real roots.





26 .	
There exists a complex number z with magnitude 1 such that $(-24+7i)z$ is a positive real number.	
Express z in the form of $a+bi$.	
	Cat Stay
	125M®
Annuar	
Answer:	
26 .	
There exists a complex number z with magnitude 1 such that $(-24+7i)z$ is a positive real number.	
Express z in the form of $a+bi$.	
	ASINE/
Anguari	
Answer:	
26.	
There exists a complex number z with magnitude 1 such that $(-24+7i)z$ is a positive real number.	
Express z in the form of $a+bi$.	
	(at Step
	V25/M87
A	
Answer:	

An equilateral triangle of side length 1 is inscribed in a circle. Find the area of the largest circle that can be inscribed between the triangle and its circumcircle.



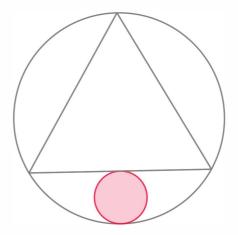


Answer:



27.

An equilateral triangle of side length 1 is inscribed in a circle. Find the area of the largest circle that can be inscribed between the triangle and its circumcircle.



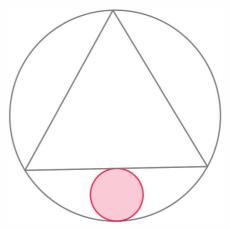




Answer:

27.

An equilateral triangle of side length $\bf 1$ is inscribed in a circle. Find the area of the largest circle that can be inscribed between the triangle and its circumcircle.







Find the value of $\sum_{n=1}^{\infty} rac{12}{16n^2+40n+21}$.

125Me



Answer:

28.

Find the value of $\displaystyle\sum_{n=1}^{\infty} \dfrac{12}{16n^2+40n+21}.$





Answer:

28.

Find the value of $\displaystyle\sum_{n=1}^{\infty} \dfrac{12}{16n^2+40n+21}$.

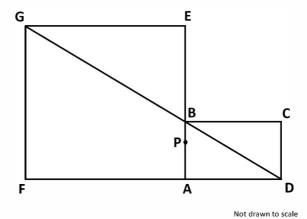




Rectangle ABCD is adjacent to square AFGE such that AB:AE=3:3+x and $B,\,D,\,G$ are collinear. Point P lies on AB such that AB:AP=3:2.

Find, as a fraction in its simplest terms:

 $\frac{\text{area of triangle} \quad BPG}{\text{area of hexagon} \quad BCDFGE}.$





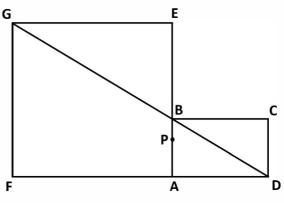
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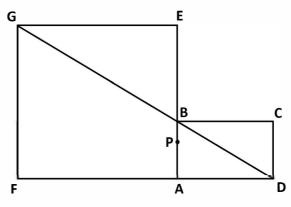
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Not drawn to scal





30.	
Given a point in an equilateral triangle is 2 cm, triangle.	$4\ cm$ and $8\ cm$ from its $3\ sides$, find the side length of the equilateral
Answer:	
30.	
Given a point in an equilateral triangle is $2 \mathrm{cm}$ triangle.	$4\ cm$ and $8cm$ from its $3\ sides$, find the side length of the equilateral
	EL TON
Answer:	
30.	
Given a point in an equilateral triangle is 2 cm, triangle.	$4\ cm$ and $8cm$ from its $3\ sides$, find the side length of the equilateral
	at the second
Answer:	