

MTH 101

calculating series...

A Product of
"Mathematics in my Bones"

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TABLE OF CONTENTS

Below are the topics in MTH101 that can be solve with the calculator with 100% accurate answers.

- INDICIES
- LOGARITHM
- SURD
- POSITIVE SQUARE ROOT
- POLYNOMIALS
- PARTIAL FRACTION
- SOLUTION OF EQUATIONS
- QUADRATIC EQUATIONS
- MAXIMUM & MINIMUM VALUE
- ALPHA & BETA SOLUTIONS
- SIMULTANEOUS LINEAR EQUATION
- BINOMIAL THEOREM
- COMPLEX NUMBER
- AP & GP

KEYS OF THE CALCULATOR

$\frac{\square}{\square}$ → TO GET FRACTION

A → Press Alpha Then (-)

B → Press Alpha Then (...)

C → Press Alpha Then (ABC)

D → Press Alpha Then (Sin)

E → Press alpha then (cos)

F → Press alpha then (tan)

X → press alpha then (i)

Y → Press alpha then (S → D)

M → Press alpha then (M⁺)

: → Press alpha then (S:□)

S → D → used to get fraction to decimal.

TO CLEAR THE CALCULATOR

Press shift 9

Enter 3 for all

= yes, then AC key


INDICIES SOLUTIONSBASIC 1PRACTICE QUESTION 1

$$\frac{4(2^{x+1}) - 2^{x+2}}{2^{x+1} - 2^x}$$

(A)1 (B)2 (C)3 (D)4

STEPS

1. Punch the question in the calculator
2. Press "CALC" button
3. Set x to be zero (0)
4. Press equation (=) the answer will appear

 THE ANSWER IS 4 (D)

BASIC IIPRACTICE QUESTION 2

Indices equation

$$2^{2x+3} + 2^{x+3} = 1 + 2^x$$

(a)1 (b)2 (c)4 (d)-3

Steps

Punch the question like this

$$2^{2x+3} + 2^{x+3} : 1 + 2^x$$

N.B (:) → ALPHA then button

Use the given option to check for the correct answers by pressing "CALC" then the option

After putting your option double click (=) and see if the answers on the left hand side is equal to the right hand side.

When you try for (-3)

$$2^{2x+3} + 2^{x+3} : 1+2^x$$

$$\frac{9}{8} : \frac{9}{8}$$

since both side are equal the correct answer is -3

PRACTICE QUESTION 1

$$\frac{25x^2 + 25x^2 - 1}{5x^2 - x} = \frac{26}{25}$$

(a) 1, 2 (b) 6, 5 (c) 0, 1 (d) 1, 6

For this case having two options it is similar to the previous one.

This case the two option given must match with the question.

N/B:

If one-digit number enters in an option and the other fails, that option is automatically wrong

$$\frac{25^{x^2} + 25^{x^2-1}}{5^{x^2-x}} = \frac{26}{25}$$

Press calc. set $x=0$

$$\frac{26}{25} : \frac{26}{25}$$

Press calc again and set $x=-1$

Left hand

right hand

$$\frac{26}{25} : \frac{26}{25}$$

Since 0, -1 enters the equation our correct answer is (0, -1) i.e C

BASIC 3

PRACTICE QUESTION 3

$$\frac{x^2 y^3 m^{-4}}{6} \times \frac{9}{x^3 y^{-3} m^4}$$

$$(a) \frac{6x}{5} \quad (b) 11x \quad (c) \frac{3y6}{2xm^8}$$

STEPS

- ! Punch the question
- Calc set x,y,m to any number of your choice.
Assuming all take (x,y,m) as (1,2,3)

Press = we get $\frac{32}{2187}$

- Punch your options one after the other setting x,y,m to be 1,2,3 as well
- When we punch option (i.e. $\frac{3y^6}{2xm^8}$) you will get the same answer as $\frac{32}{2187}$ so C is the answer.

PAST QUESTIONS ON INDICES

1. $\frac{x^2y^3m^{-4}}{6} \times \frac{9}{x^3y^{-3}m^4}$ (a) $\frac{6}{x^2}$ (b) $\frac{6y}{x}$ (c) $\frac{3y^6}{2xm^8}$
2. $\frac{3(2n+1)-4(2n-1)}{2n+1-2n}$ (a) 1 (b) 3 (c) 4
3. $2^{2x+3} + 2^{x+3} = 1+2^x$ (a) 6 (b) 10 (c) 2 (d) -3
4. $9^{2x+1} = \frac{81x^{-2}}{3x}$ find x (a) -3 (b) -2 (c) -10 (d) 11 (d) 12
5. $\frac{(2^x+1)^y}{(2^y+1)^x} \times \frac{2^{2x}}{2^{2y}} \times 2^y$ (a) 3^x (b) 2^y (c) 9^y (d) 2^x
6. $(225^{1/2} + 85^0) \times 256^{-1/4}$ (a) 1 (b) 4 (c) $\frac{1}{4}$ (d) 16 (e) $\frac{1}{16}$
7. $\sqrt{160r^2} + \sqrt{71r^2} + \sqrt{100r^8}$ (a) 10r (b) $10r^2$ (c) 13r (d) $13r^2$
(e) NOA
8. Find the value of x and y respectively if $3^{2x+y} = 27$ and $2^{x-y} = 8$ (a) 2, -1 (b) 1,2 (c) 2,3 (d) -2,-3 (e) 1,-1.

9. $5^{x+1} + 5^x = 150$ (a) 1 (b) 6 (c) 3 (d) 2
10. $A^8 b^2 c^{-6} \times a^{-5/2} bc^{1/2} \div a^{7/2} c^{7/2}$ (a) $a^2 b^3 c^{-9}$ (b) abc (c) $a^2 b^2 c^3$ (d) $a^2 b^3 c^9$ (e) abc^2
11. $2^{2x+8} - 32(2^x) + 1 = 0$ (a) -4 (b) 4 (c) 7 (d) 2 (e) 3
12. Simplify $\sqrt[5]{\frac{x^{10}}{32y^{25}}} (\log_2 4)$ (a) $2xy^2$ (b) $\frac{x^2}{2y^5}$ (c) $\frac{x^2}{y^5}$ (d) $\frac{x^2}{4y^5}$ (e) NoA
13. Simplify $(1+a^{n-m})^{-1} + (1+a^{m-n})^{-1}$ (a) 0 (b) $\frac{1}{2}$ (c) a^{n+m} (d) a^{n-m} (e) 1
14. $(17)^{3.5} \times 17^y = 17^8$, find y (a) 2.29 (b) 2.75 (c) 4.25 (d) 4.5
15. If $(a/b)^{x-1} = (b/a)^{x-3}$ find the value of x (a) $\frac{1}{2}$ (b) 1 (c) 2 (d) $\frac{7}{2}$

LOG

There are two (2) log in your calculator;

- \log_a (Normal)
- $\log \frac{a}{b}$ (Base log)

You make use of base log when the question has a base log like $\log_3 10$

PRACTICE QUESTION

$$\log_7(49^9) - \log_{10} 0.01$$

- (a) 2 (b) 6 (c) 20

Punch the question directly in the calculator press =Ans = 20

LOG EQUATION

$$\log_{10}(3X - 1) - \log_{10} 2 = 3$$

(a) 6 (b) 600 (c) 667

STEPS

- Punch the question like this;

$$\log_{10}(3X - 1) - \log_{10} 2 : 3$$

Since it is having an equation we make use of
(:) format to check for our option as indicial equation.

Recall;

The Right hand side must be equal to the left hand side.

When you try 667

Left	.	Right
------	---	-------

3	.	3
---	---	---

The answer is 667

PAST QUESTIONS ON LOG

1. $\log_7 49^9 - \log_{10} 0.01$ (a) 12 (b) 16 (c) 19 (d) 20

2. $\frac{\log 27 + \log 8 - \log 125}{\log 6 - \log 5}$ (a) 1 (b) 2 (c) 6 (d)

3. $\frac{\log \sqrt{27} - \log \sqrt{8}}{\log 3 - \log 2}$ (a) $\frac{1}{2}$ (b) 6 (c) 9 (d) $\frac{3}{2}$
4. $\log_{10}(3x - 1) - \log_{10} 2 = 3$ (a) 300 (b) 600 (c) 450 (d) 667
5. $\log_x 3 + \log_3 x = \frac{10}{3}$ (a) 6, $\sqrt{3}$ (b) $\frac{1}{3}$, 19 (c) 17, 3 (d) 27, $3\sqrt{3}$
6. $\log(3x + 2) - 2\log x = 1 - \log(5x - 3)$ (a) 1 (b) 2 (c) 3 (d) NoA
7. $\log_{10} \frac{41}{35} + \log_{10} 70 - \log_{10} \frac{41}{2} + 2\log_{10} 5$ (a) 5 (b) 4 (c) 3 (d) 2 (e) 1
8. Solve for n if $\log_3(2n + 3) = \log_3(n - 5)$ (a) -7 (b) 14 (c) 16 (d) 20 (e) -5
9. What is the value of $\frac{\log_2 125}{\log_9 25}$ (a) 0.301 (b) 1 (c) 100 (d) 0.002 (e) 2.4
10. $6\log_x 2 - 3\log_x 3 = 3\log_5 0.2$ (a) $\frac{1}{2}$ (b) $\frac{6}{5}$ (c) $\frac{9}{13}$ (d) $\frac{3}{4}$
11. Find the value of X if $\log_{10} 5 + \log_{10}(x + 2) - \log_{10}(x - 1) = 2$
(a) 3 (b) 6 (c) $\frac{13}{19}$ (d) $\frac{22}{19}$ (e) NOA
12. Evaluate $\frac{\log \sqrt{64} - \log \sqrt{8}}{\log 4 - \log 3}$
(a) 3 (b) 2 (c) 3 (d) $\frac{3}{2}$ (e) $\frac{5}{2}$
13. Solve for X if $\log_4 x - \log_4(x - 1) = \frac{1}{2}$
(a) 1 (b) 2 (c) 4 (d) 8

SURDBASIC 1PRACTICE QUESTION

Variable surd

$$\frac{1}{X + \sqrt{X^2 - 1}}$$

(a) $\frac{2}{x}$ (b) $x - \sqrt{x}$ (c) $x - \sqrt{x^2}$

STEPS

- Punch the question.
- Set x to be any digit, let's use 2
- Press = it gives $2 - \sqrt{3}$
- Then punch the option one after the other, pressing "CALC" and set X to be 2 as well.

When you do that for option C it will have the same answer as $2 - \sqrt{3}$

Therefore, option C becomes the answer.

SURDIC EQUATION

$$\sqrt{3x + 4} - \sqrt{x + 2} = 0$$

(a) 1 (b) 0 (c) 7 (d) 5

Steps

- Punch the question like this

$$\sqrt{3x+4} - \sqrt{x+2} : 0$$

N/B: \Rightarrow "(:)" This is used because it is an equation.

- Press "CALC" and put your options one after the other.

Recall the rule of:

The left hand side must be equal to the right hand side.

Try option (C) i.e 7

Left gives: Right gives

$$0 : 0$$

Correct answer = 7 (C)

POSITIVE SQUARE ROOT

Find the positive square roots of $19 + 6\sqrt{2}$

(a) $1+\sqrt{2}$ (b) $1+2\sqrt{2}$ (c) $1+3\sqrt{2}$

STEPS

- Press the question like $\sqrt{19 + 6\sqrt{2}}$
- Press = 5.24

MTHS101 KEY POINT

- Punch your option the way it is given into your calculator, then press $S \Rightarrow D$ key to put your answer in decimal.
- Check all the options that way until it matches with 5.24

Try option C (i.e) $1+3\sqrt{2}$

Press $=$, then $S \Rightarrow D$ key we have 5.24 which matches the question.

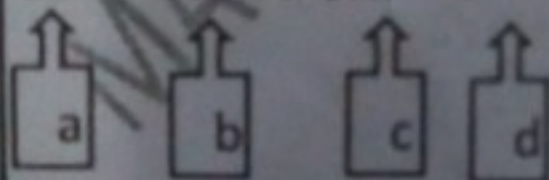
Option C is the answer.

POLYNOMIALS

To get the 3 values of a polynomial equation.

- Press mode
- 5
- 4
- Input the coefficient of your given polynomial

$$2x^3 - 11x^2 + 17x - 6$$



Pressing equal ($=$) to move to the next, then at the end of inputting all the coefficient, press $=$

$$X_1 = 1/2, X_2 = 3, X_3 = 2$$

PAST QUESTIONS ON SURDS

1. $\sqrt{75} + \sqrt{27} - \sqrt{12}$ (a) 3 (b) $6\sqrt{2}$ (c) $\frac{1}{2}$ (d) $6\sqrt{3}$
2. If $a = 2 + \sqrt{5}$ find the value of $a - \frac{1}{a}$ (a) 1 (b) 2 (c) 9 (d) 4 (d) 16
3. Simplify $\frac{1}{x + \sqrt{x^2 - 1}}$ (a) $\frac{6}{\sqrt{x^2 + 1}}$ (b) $x - \sqrt{x}$ (c) $x - \sqrt{x^2 - 1}$
4. $\sqrt{3x + 4} \cdot \sqrt{x + 2} - \sqrt{x - 3} = 0$ (a) $-\frac{7}{3}$ (b) $\frac{7}{3}$ (c) 7 (d) 3
5. $\sqrt{2x + 1} - \sqrt{x - 3} = 2$ (a) 1, 3 (b) 2, 6 (c) 3, 9 (d) 4, 12 (e) 5, 8
6. $(x + \sqrt{x^2 - 1})^{-1}$ (a) $\frac{1}{x}$ (b) $\frac{1}{x^2}$ (c) $x - \sqrt{x^2 - 1}$ (d) $x + \sqrt{x^2 - 1}$ (e) $-\sqrt{x^2 - 1}$
7. If $a = (2 - \sqrt{3})^{-1}$ and $b = (2 + \sqrt{3})^{-1}$ find $a^2 + b^2$ (a) 19 (b) 16 (c) 10 (d) 14 (e) NOA
8. Find the positive square root of $19 + 6\sqrt{2}$ (a) $6 + \sqrt{5}$ (b) $9 + \sqrt{3}$ (c) $1 + 3\sqrt{2}$
9. Find the positive square root of $7 + 2\sqrt{6}$ (a) $\sqrt{3} + 1$ (b) $1 + \sqrt{3}$ (c) $9 + \sqrt{3}$ (d) $6 + \sqrt{32}$ (e) NoA
10. Find the positive square root of $6 + \sqrt{32}$ (a) $2 + \sqrt{3}$ (b) $2 + \sqrt{2}$ (c) $3 + \sqrt{2}$ (d) $2 + \sqrt{5}$ (e) $3 - \sqrt{3}$

11. Solve for X given that $\sqrt{x+2} + \sqrt{x-1} = 3$ (a) 0 (b) 1 (c) 2 (d) 0, 2 (e) 1, 3
12. If $X = 3 + 2\sqrt{2}$, then the value of $(\sqrt{x} - \frac{1}{\sqrt{x}})$ is (a) 1 (b) 2 (c) $2\sqrt{2}$ (d) $3\sqrt{3}$
13. Find the area of a rectangle whose length and width are given respectively $\frac{3}{\sqrt{7}-\sqrt{3}}$ and $\frac{2}{\sqrt{7}+\sqrt{3}}$ (a) $\frac{3}{5}$ (b) $\frac{5}{3}$ (c) $\frac{3}{2}$ (d) $\frac{2}{3}$ (e) $\frac{1}{3}$

REMAINDER THEOREM

Find the Remainder when

$$X^{100} - X^{99} + X^{69} + 7$$

Is divided by $x+1$

- (a) 2 (b) 3 (c) 1

STEPS

- Set $x+1=0$, $x = -1$
- Punch the question, i.e

$$X^{100} - X^{99} + X^{69} + 7$$

- Calc. and set $X = -1$

- Press = Ans = -1

Option (C)

PAST QUESTIONS ON POLYNOMIALS

1. Find the remainder of the polynomial when $4x^3 - 5x^2 + 2$ is divided by $x-1$ (a) 2 (b) 6 (c) 1 (d) NoA
2. Find the remainder of the polynomial when $4x^3 - 5x^2 + 2$ is divided by $3x-1$ (a) 41 (b) $\frac{3}{8}$ (c) $\frac{43}{27}$
3. Find the remainder when $x^{100} - x^{99} + x^{69} + 7$ is divided by $x + 1$ (a) 1 (b) 6 (c) 7 (d) 8
4. Factorize the polynomial $2x^3 - 11x^2 + 17x - 6$ and hence solve the equation $2x^3 - 11x^2 + 17x - 6 = 0$
 - (a) $(x-3)(x+2)(3x-1)$
 - (b) $(x-6)(3x+2)(9x-1)$
 - (c) $(x-2)(x+3)(2x-1)$
5. Find k if $x-1$ is a factor of x^3+kx^2-x-8 (a) 6 (b) 3 (c) -9 (d) -8

PARTIAL FRACTION

PRACTICE QUESTION

$$\frac{x-3}{(x^2+3)(x+1)}$$

$$(a) \frac{x}{x+3} - \frac{1}{x+2}$$

$$(b) \frac{x}{x^2+3} - \frac{1}{x+1}$$

STEPS

- Punch the question;

$$\frac{x-3}{(x^2+3)(x+1)}$$

- Press calc to set x to be any digit, let use 2.
- Press =, We have $\frac{-1}{21}$
- Punch the option one after the other setting X to be that same value you used for the question, which is 2.

Any option that gives $\frac{-1}{21}$, become the Right Answer.

When you check for option B, (i.e) $\frac{x}{x^2+3} - \frac{1}{x+1}$

Calc. X=2 we have $\frac{-1}{21}$

Which correspond with the question.

CASE 2

$$\frac{x+1}{(x-1)(x^2+1)} \equiv \frac{A}{x-1} + \frac{Bx+C}{x^2+1}$$

Find A,B,C,

- (a) (1,1,1)
- (b) (-1,0,1)
- (c) (1,-1,1)

(d) (1,-1,0)

(e) (1,0,-1)

STEPS

- Punch the question

$$\frac{X+1}{(X-1)(X^2+1)}$$

- Press calc to set x to be any value

Assuming we used 2

- Press equal to (=) we have $\frac{3}{5}$ as answer.

- Punch this now

$$\frac{A}{(X-1)} + \frac{Bx+C}{(X^2+1)}$$

* Set x to be that number (ie 2) used your option given, each option represents ABC.

When we try option D (1,-1,0) it gives $\frac{3}{5}$

A=1, B=-1, C=0

Ans=D

PAST QUESTIONS ON PARTIAL FRACTIONS

1. Resolve $\frac{x}{x^2-9}$ (a) $\frac{3}{2} (\frac{3}{x-3} + \frac{1}{x+3})$ (b) $2(\frac{3}{x-1} + \frac{1}{x+3})$ (c) $\frac{1}{2} (\frac{1}{x-3} + \frac{1}{x+3})$

2. Resolve $\frac{x^2 + x^2 + 4x}{x^2 + x - 2}$ into partial fraction (a) $\frac{2}{x+4} + \frac{3}{x-1}$ (b) $x^2 +$

$\frac{4}{x-2} + \frac{2}{x+2}$ (c) $x + \frac{4}{x+2} + \frac{2}{x-1}$

3. Resolve $\frac{2x^2 + 5x - 1}{(x)(x-1)(x+2)}$ into partial fraction (a) $\frac{3}{3x} + \frac{1}{2x} + \frac{2}{x-1}$

(b) $\frac{6}{x} + \frac{9}{x^2} + \frac{3}{x-1}$ (c) $\frac{1}{2x} + \frac{2}{x-1} - \frac{1}{2(x+2)}$

4. Resolve into partial fraction $\frac{3x^2 - 4x + 5}{(x+1)(x-3)(2x-1)}$ (a) $\frac{2}{x+1} + \frac{3}{x-1} -$

$\frac{1}{6x+2}$ (b) $\frac{3}{x+2} + \frac{4}{x-1} + \frac{3}{x+2}$ (c) $\frac{1}{x+1} + \frac{1}{x-3} - \frac{1}{2x-1}$

5. Resolve into partial fractions $\frac{x^3}{(x+1)^2}$ (a) $x+3 + \frac{2}{(x+1)} - \frac{1}{(x+2)^2}$

(b) $x-2 + \frac{3}{(x+1)} - \frac{1}{(x+1)^2}$ (c) $x+3 + \frac{2}{x+1} - \frac{2}{(x+2)^2}$

6. $\frac{x+1}{(x-1)(x^2+1)} = \frac{A}{x-1} + \frac{Bx+C}{x^2+1}$ find the value of ABC (a) (1, 1, 1)

(b) (-1, 0, 1) (c) (1, -1, 1) (d) (1, -1, 0) (e) (1, 0, -1)

7. $\frac{2x^2 + x - 2}{x^4 - x^3} = \frac{A}{x-1} + \frac{B}{x} + \frac{C}{x^2} + \frac{D}{x^3}$ Find the value of ABCD (a)

1, 1, 1, 2 (b) -1, -1, 1, 2 (c) 1, 1, -1, 2 (d) -1, 1, 1, 2 (e) 1, -1, 1, 2

8. $\frac{2x^2 + 5x - 1}{x(x-1)(x+2)} = \frac{A}{x} + \frac{B}{x+1} + \frac{C}{x-2}$ find the constants A, B, C (a)

$\frac{1}{2}, 2, \frac{-1}{2}$ (b) 2, 3, 1 (c) $\frac{1}{2}, \frac{-1}{2}, 1$ (d) 1, 1, $\frac{1}{2}$ (e) 2, -3, 1 Given

that $\frac{x+1}{(x-1)(x^2+1)} = \frac{A}{x-1} + \frac{Bx+C}{x^2+1}$ find the value of A, B, C

respectively (a) 1,1,1 (b) -1,0,1 (c) (1,-1,1) (d) 1, -1,0 (e) (1,0,-1)

9. Resolve $\frac{x-4}{x^2+x-2}$ into partial fraction (a) $\frac{2}{x+2} - \frac{1}{x-1}$ (b) $\frac{1}{x-1} - \frac{2}{x+2}$ (c) $\frac{1}{x-1} + \frac{2}{x+2}$ (d) $\frac{-1}{x-1} - \frac{2}{x+2}$ (e) NoA

10. Resolve $\frac{2+3x-x^2}{x(x^2-1)}$ into partial fractions (a) $\frac{2}{x-1} - \frac{2}{x} - \frac{1}{x+1}$ (b) $\frac{2}{(x-1)} + \frac{2}{x} - \frac{1}{x+1}$ (c) $\frac{2}{x-1} + \frac{2}{x} + \frac{1}{x+1}$ (d) $\frac{2}{x-1} - \frac{2}{x} + \frac{1}{x+1}$ (e) $\frac{2}{(x-2)} - \frac{2}{x} - \frac{-1}{x+2}$

QUADRATIC EQUATIONS

To get values of a quadratic equation.

$$X^2 - 2X - 3 = 0$$

STEPS

- Press mode
- 5
- 3

Input the coefficient of the equation by pressing = to enable it moves to the other.

$$X^2 - 2X - 3$$

$$\downarrow \quad \downarrow \quad \downarrow$$

$$a \quad b \quad c$$

$$X_1=3 \text{ and } X_2=-1$$

N/B: PRESS MODE AND 1 TO CLEAR OUT.

α & β Solution

If α & β are the roots of $X^2 - 2X - 3$

Find the following,

a) $\alpha^2 + \beta^2$

b) $\alpha^3 + \beta^3$

c) $4\alpha + 3\beta$

d) $4\alpha\beta^2$

STEPS

- Punch out the given quadratic equation ($x^2 - 2x - 3$) we get $X_1 = 3$ & $X_2 = -1$
- Automatically, make one of your value to be α and the other to be β .

$$(x_1 = 3 = \alpha, x_2 = -1 = \beta)$$

- Having gotten α and β , you can then compute anything you are given to solve.

Let's Solve

a) $\alpha^2 + \beta^2$

$$(3)^2 + (-1)^2$$

$$= 9 + 1 = 10$$

b) $\alpha^3 + \beta^3$

$$(3)^3 + (-1)^3$$

$$27 - 1 = 26 \text{ Ans}$$

c) $4\alpha + 3\beta$

$$4(3) + 3(-1)$$

$$12 - 3 = 9 \text{ Ans}$$

d) $4\alpha\beta^2$

$$4(3)(-1)^2 = 12 \text{ Ans}$$

SIMULTEOUS EQUUATON

$$x^2 - y^2 = 24 \text{ ----- Equ(1)}$$

$$\frac{1}{x+y} + \frac{3}{x-y} = \frac{11}{12} \text{ ----- Equ(2)}$$

Find the value of x and y

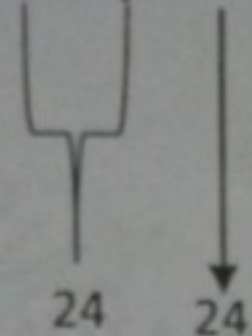
(a) 2,6 (b) 9,3 (c) 5,1

STEPS

- Punch any equation of your choice as given we take equ.(1)
- Punch using (:) Rule since it is an equation we have;
 $x^2 - y^2 : 24$
- Press calc and use your options to check for the correct answer each option stands for x and y.
- Recall the Rule (:) which states the left hand side must be equal to the right hand side.

Now let's take option D (5,1) it means $x=5, y=1$

$$x^2 - y^2 : 24$$



Since both side gave 24, the answer is D i.e $x=5, y=1$

you can try that for the second equation it will give same answer.

PAST QUESTIONS ON SOLUTIONS OF EQUATIONS

- Solve $2x^2 + 5x - 12 = 0$
(a) 1,2 (b) 6,3 (c) 4,2 (d) $4, \frac{3}{2}$ (e) NOA
- Solve $2x^2 + 3x - 1 = 0$ using the method of completing the square
(a) $\frac{-3\sqrt{2}+2}{6}$ or $\frac{-3\sqrt{2}-2}{6}$ (b) 6,2 (c) $9 - \sqrt{2}$ or $9 + \sqrt{2}$
(d) $\frac{-3+\sqrt{17}}{4}$ or $\frac{-3-\sqrt{17}}{4}$ (e) NoA

Use the info below to solve question 3-5

If α and β are the root of $3x^2 - 4x - 1 = 0$ find the following

- $\alpha + \beta$ (a) $\frac{1}{2}$ (b) 6 (c) $\frac{4}{3}$ (d) 5

4. $\alpha^3 + \beta$ (a) 2 (b) 6 (c) 9 (d) $\frac{22}{9}$
5. $\frac{1}{\alpha} + \frac{1}{\beta}$ (a) 2 (b) -2 (c) -4 (d) 8
6. suppose α and β are the roots of the equation $x^2 + 2x + 3 = 0$.
Find the value of $\alpha^3 + \beta^3$ (a) 6 (b) 7 (c) 8 (d) 9 (e) 10
7. find the minimum value of $3x^2 - x + 1$ (a) 2 (b) $\frac{2}{3}$ (c) $\frac{27}{19}$ (d) $\frac{11}{12}$
8. find the maximum value of the function $5 - x - 2x^2$ (a) 3 (b) $\frac{14}{3}$
(c) $\frac{41}{8}$
9. solve the simultaneous equation $x^2 + y^2 = 24$ $\frac{1}{x+y} + \frac{3}{x-y} = \frac{11}{12}$
(a) 2, 3 (b) 6, 9 (c) 5, $\frac{-25}{3}$
10. If α and β are the roots of the equation $x^2 - 4x - 1 = 0$
Find the value of $\alpha^3 + \beta^3$

MAXIMUM AND MINIMUM VALUE

Either you are asked to find maximum or minimum value it means the same thing, it has the same format.

Practice question

Find the minimum value of $3x^2 - x + 1$

- (a) $\frac{3}{5}$ (b) $\frac{11}{12}$

STEPS

- Get $\frac{-b}{2a}$ from the given equation.

Recall that $3x^2 - x + 1$

$$\begin{array}{ccc} \downarrow & \downarrow & \downarrow \\ a & b & c \end{array}$$

From the equation we have; $a=3$, $b=-1$

$$\therefore \frac{-b}{2a} = \frac{-(-1)}{2(3)} = \frac{1}{6}$$

- Punch the equation $3x^2 - x + 1$
- Press calc. and set x to be $\frac{1}{6}$
- Press equal to (=) we have $\frac{11}{12}$ as answer, which option B is the answer.

N:B- The same steps also apply for finding maximum value.

BINOMIAL THEOREM

The only binomial theorem with calculator is the one with "HENCE"

Practice question

Obtain the 1st 5 term of the expansion $(1+x)^{\frac{1}{2}}$ "HENCE"
evaluate $\sqrt{1.03}$ to five significant figure.

- (a) 0.43692 (b) 0.69908 (c) 1.01489

STEPS

- Ignore $(1 + x)^{\frac{1}{2}}$
- Punch $\sqrt{1.03}$
- Press =

We have 1.01489 as answer, option C is the correct answer.

Practice question 2

Using the expansion of $(1 - 2x)^{\frac{1}{3}}$. Find the value of $(1.05)^{\frac{1}{3}}$.

STEPS

- Ignore $(1 - 2x)^{\frac{1}{3}}$
- Punch $(1.05)^{\frac{1}{3}}$
- Press =

We have 1.016985 as answer.

COMPLEX NUMBER

For you to be able to solve any complex number problem, you must change your calculator to complex mode.

Steps to change to complex mode

- Mode
- 2

N:B "i" can be gotten from "(Eng)" key in the calculator.

Practice Question 1

Evaluate $\frac{3-i}{1+i}$

Steps

- Punch the question $\frac{3-i}{1+i}$
- Press (=) the answer will appear.
We have $1-2i$ (Ans)

Practice Question 2

Evaluate $(2+3i)^2$

- Punch $(2+3i)^2$
- press = we have $-5+12i$ (Ans.)

QUESTIONS ON COMPLEX NUMBER

- Express $(2+3i)^2$ in the form $a+bi$ (a) $2+5i$ (b) $6-17i$ (c) $-5+12i$
- Evaluate x and y if $x+iy = \frac{3-i}{1+i}$ (a) $\frac{100}{27}$ (b) $\frac{25}{3}$ (c) 4 (d) 20 (e) 76 .

$1y\text{-caret} = -23 \rightarrow$ answer for the first term.

$$T_n = a + (n-1)d$$

\Rightarrow To find the 52nd terms, $52y\text{-caret} = 334$

To find the common difference,

Solve;

$$7y\text{-caret} - 12 = 7$$

For d.

Because 7th term is not given and 6th term is 12.

\Rightarrow Sum of Arithmetic progression by calculator.

Sum of the first 60 terms; AC \rightarrow SHIFT \rightarrow log[ε] \rightarrow

ALPHA \rightarrow) [X] \rightarrow SHIFT \rightarrow 1[STAT] \rightarrow 7: Reg \rightarrow

5: y - caret

\rightarrow SHIFT \rightarrow) [.] \rightarrow 1 \rightarrow SHIFT \rightarrow) ([.] \rightarrow 60 \rightarrow)

\Rightarrow The calculator will display $\sum(xy\text{-caret}, 1, 60)$

Then press [=].

$$\sum(xy\text{-caret}, 1, 60) = 11010 \text{ Ans}$$

Another way to solve for the Sun

\Rightarrow Reset your calculator into general calculation.

Mode: MODE → 1:Comp then SHIFT → log.

→ sum of first 60 terms;

$$\sum_{x=1}^{60} (-23 + (\text{ALPHA} \times -1) \times 7)$$

$$= 11010$$

Formular;

$$\sum_{x=1}^r (a + (n-1) \times d)$$

Y=number of sum AP.

$$n=x$$

or you can do;

$$\sum_{x=0}^{59} (-23 + 7 \times x)$$

$$= 11010$$

Which yield the same result.

GEOMETRIC PROGRESSIONQuestion

Given the sequence,

2, 6, 18, 54, ...

- Find the 12th term.
- Find n if $a_n = 9,565,938$
- Find the sum of the first ten terms.

Solution by calculator

MODE \rightarrow 3:STAT \rightarrow 6:A.B^X.

X	Y
1	2
2	6
3	18

Y-caret= To find T_n and sum of n terms.

X-caret= To find n (number of terms when T_n is given)

MODE \rightarrow 3:STAT \rightarrow 6:A.B^x

X	Y
(term)1 st	2
(term)2 nd	6
(term)3 rd	18

To solve for the 12th term.

AC \rightarrow 12SHIFT \rightarrow 1[STAT] \rightarrow 7:Reg \rightarrow 5:y-caret.

\Rightarrow 12y-caret = 354294 Ans

* To solve for n,

$\therefore 9565938x - \text{caret} = 15$ Ans

(c) Sum of the first ten terms;

AC \rightarrow SHIFT \rightarrow Log[Σ] \rightarrow ALPHA \rightarrow) [X] \rightarrow SHIFT \rightarrow 1[STAT] \rightarrow) [L] \rightarrow 1 \rightarrow SHIFT \rightarrow [,] \rightarrow 10 \rightarrow).

The calculator will display $\Sigma(xy - \text{caret}, 1, 10)$

$$\therefore \Sigma(xy - \text{caret}, 1, 10) = 59048 \text{ Ans}$$

OR

You can also solve the sum out-side the STAT mode.

(Mode \rightarrow 1:Comp then SHIFT \rightarrow log | Σ |)

Each term which is given by $a_n = ar^{n-1}$

Or $T_n = ar^{n-1}$

Where, a =first term and r =common difference

$$\sum_{x=1}^{10} (2(3^{x-1})) = 59048$$

Or

$$\sum_{x=0}^9 (2 \times 3^x) = 59048$$



SIPISI

NEWS NETWORK

*wishes you success
as you scale through.*