

**Solving Samples of Math Problems**  
**Using**  
**CASIO FX-CG50 CALCULATOR**

# EMSAT-EXAM

**Done By Casio Middle East - GAKUHAN**

**Support  
Classroom with  
Technology**

CASIO calculators - smart educational tools  
for ideal educational environments.



EMSAT Math (GT) is a computer-based exam and has 3 major sections – Algebra, Geometry, and Statistics. Test Sections, questions, and options are randomized. Items consist of multiple choice, fill-in-the-blank, and drag to blank items. Sections and subsections of the test are timed by the computer. Test takers can see how much time they have throughout the exam.

#### The Emirates Standardized Test (EmSAT) Definition

The EmSAT is a national system of standardized computer-based tests, based on United Arab Emirates national standards.

#### Objective

To ensure that students are equipped with the necessary knowledge and skills to effectively participate in the modern knowledge based global society.

#### Importance of EmSAT

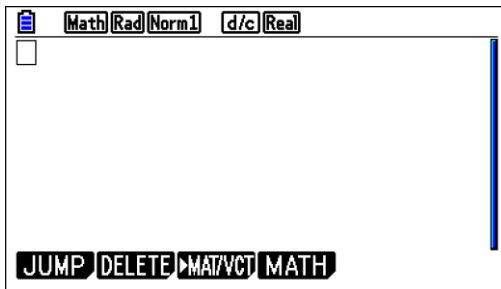
- Specifies the students' performance level nationally and internationally.
- Supports the Ministry of Education in evaluating the government and the private.
- schools' performance.
- Alternative of other higher education entry tests.
- Measures students' performance improvement over the time.
- Helps the government and the private schools in developing improvements plans for students' current performance.
- Helps cycle two students to select for themselves suitable education track for their cycle three level.
- Helps the higher management to take decisions to improve educational system.

**Q.1.** What is the solution set of the the following equation?

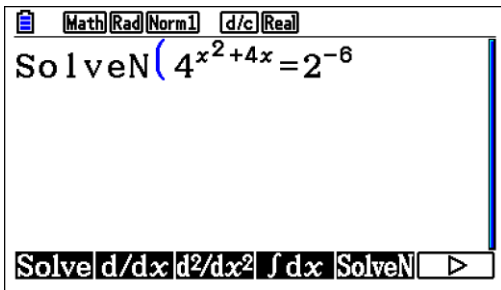
ماهي مجموعة الحل للمعادلة التالية؟

$$4^{x^2+4x} = 2^{-6}$$

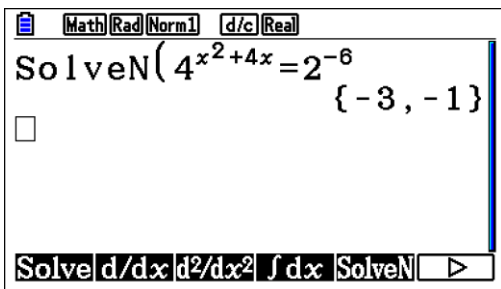
- A.
- B.
- C.
- D.



1- select Run-Matrix from main menu



2- OPTN to select solveN



3- write the equation

Answer : (c) [-3,-1]

**MENU** **1** **OPTN** **F4** **F5** **4** **^** **X,θ,T** **x<sup>2</sup>** **+** **4** **X,θ,T** **▶** **SHIFT** **•** **2** **^** **-** **6** **EXE** **EXIT**

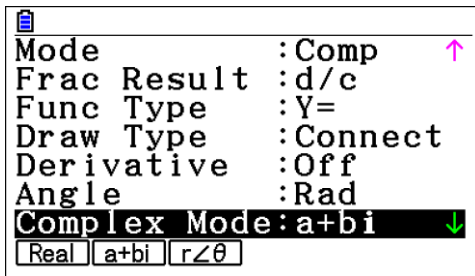
Q.2. Write the expression below in simplest form.

اكتب التعبير أدناه بأبسط صورة

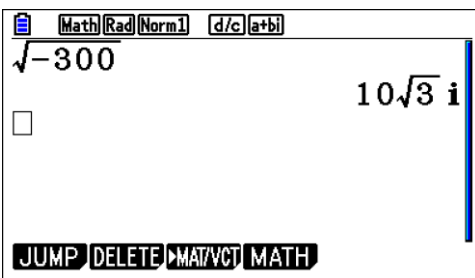
$$\sqrt{-300}$$

- A.
- B.
- C.
- D.

Firstly set the complex mode a+bi



Now you can simplify the root



Answer : (c)  $10\sqrt{3}i$

**MENU** **1** **SHIFT** **MENU** **▼** **▼** **▼** **▼** **▼** **▼** **F2** **EXIT**

**Q.3.**

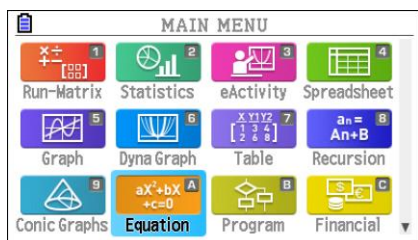
Solve.

حل المعادلة التالية :

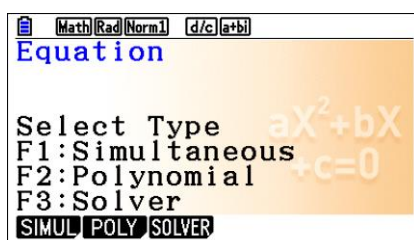
$$y^2 - 3y = 9$$

- A.
- B.
- C.
- D.

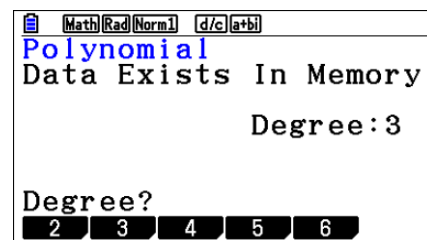
Write the equation with general formula  
 $ay^2 + by + c = 0$  ,  $y^2 - 3y - 9 = 0$



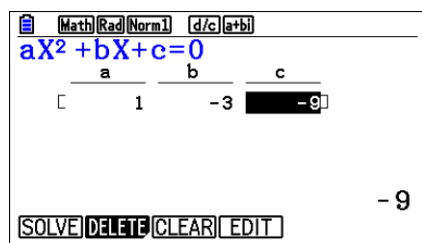
1- From main menu select equation



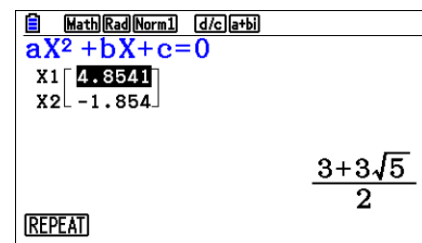
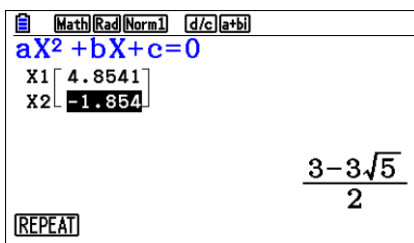
2-select polynomial



3- Choose the degree



4- enter the values of a,b,c,



Answer : (b)  $\frac{3+3\sqrt{5}}{2}$

**Q.4.**

For her phone, Halima pays a monthly fee of 18 AED and she pays an additional 5 fils per minute of use.

تدفع حلّمة لهاتفها شهرياً رسوماً بمقدار 18 درهماً، وتدفع 5 فليس لكل دقيقة إضافية استخدمتها.

The least she has been charged in a month is 71.90 AED.

أقل مبلغ تم تسجيله لها في شهر ما هو 71.90 درهماً.

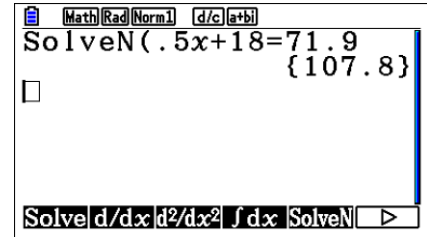
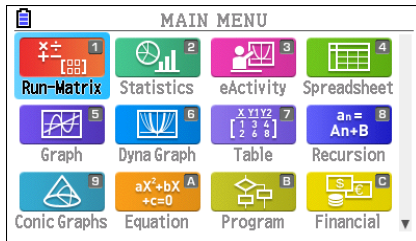
What is the minimum number of minutes she has used on her phone in a month?

ما الحد الأدنى من الدقائق التي استخدمتها حلّمة في هاتفها لهذا الشهر؟

Minimum number of minutes used:  أقل عدد من الدقائق المستخدمة:

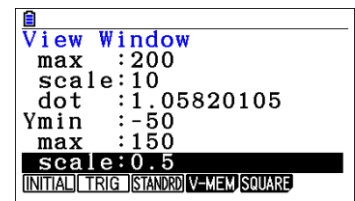
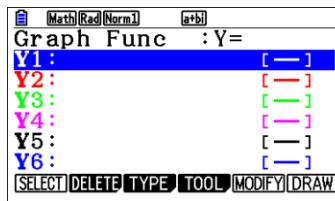
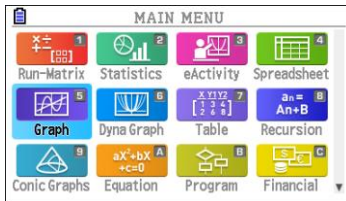
1<sup>st</sup> method : Consider it an equation and solve it

Answer : 107.8



**MENU** **1** **OPTN** **F4** **F5** **.** **5** **X,θ,T** **+** **1** **8** **SHIFT** **.** **7** **1** **.** **9** **EXE** **EXIT** **S+D**

2<sup>nd</sup> method by graphing

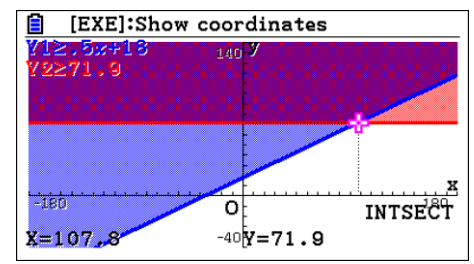
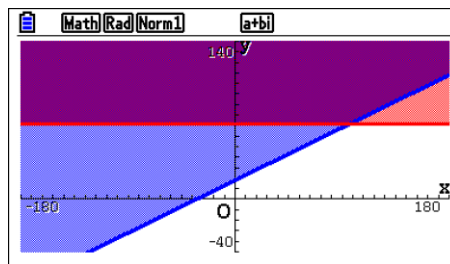
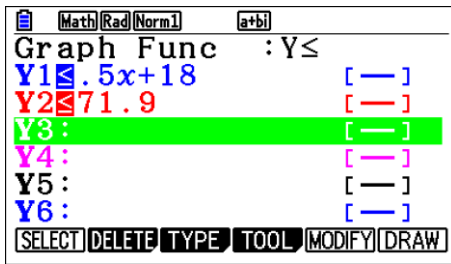


1-select graph icon

2- change the type

3- set the view window

**MENU** **5** **F3** **SHIFT** **F3** **-** **2** **0** **0** **EXE** **2** **0** **0** **EXE** **1** **0** **EXE** **▼** **-** **0** **EXE** **1** **5** **0** **EXE**



4- enter two equation then draw

5- G-solve to see the intersection

**F3 F6 F3**  $\odot$  **5**  $\langle X, \theta, T \rangle$  **+** **1** **8** **EXE** **7** **1**  $\odot$  **9** **EXE** **F6** **F5** **F5**

**Q.5.**

Here are scores of 20 students on an algebra test.

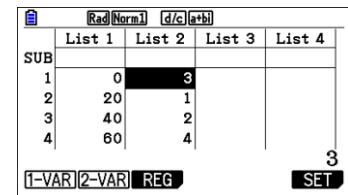
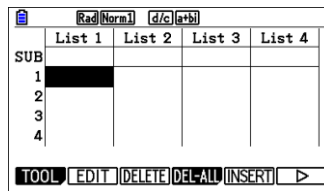
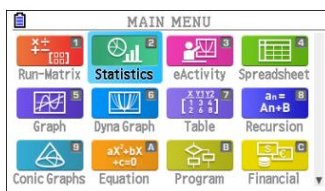
فيما يلي درجات 20 طالباً في اختبار الجبر.

Score	0	20	40	60	80	100	الدرجة
Frequency	3	1	2	4	8	2	التكرار

Find the mean of this data set.

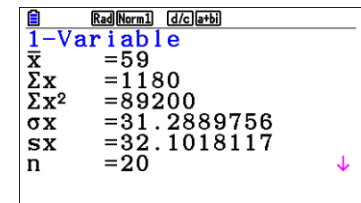
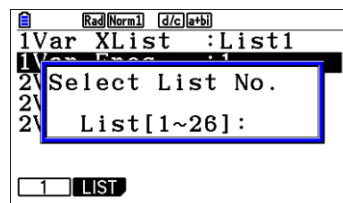
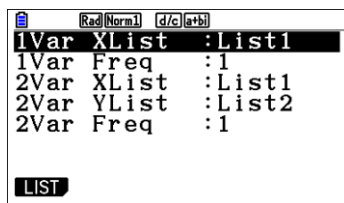
أوجد المتوسط الحسابي لمجموعة البيانات

Mean:  المتوسط الحسابي:



**MENU** **2** **F2** **F6**  $\blacktriangledown$  **F2** **2** **EXE** **EXIT** **F1**

In list 1 enter the values of score and in list 2 enter the values of frequency



Answer : 59

**Q.6.**

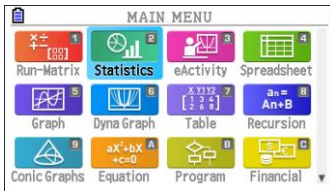
The heights of boys in a grade 10 class are normally distributed with a mean of 168 cm and a standard deviation of 2.5 cm.

يعتبر توزيع أطوال الطلاب في الصف 10 توزيعاً معيارياً، بمتوسط مقداره 168 سم وانحراف معياري 2.5 سم.

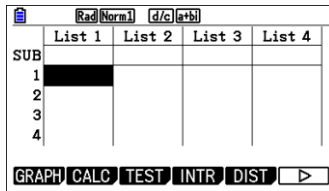
In which range do 95% of the heights approximately fall?

ما هو المدى الذي تقع فيها 95% من الأطوال تقريباً؟

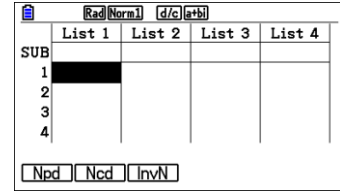
- A.
- B.
- C.
- D.



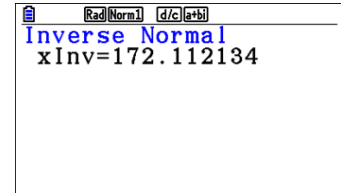
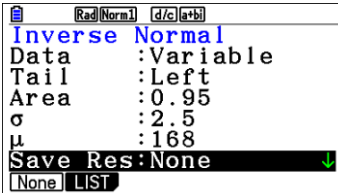
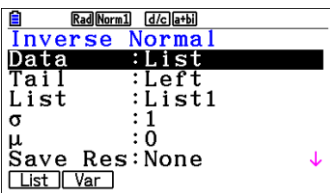
1- Select statistics mode



2- DIST and normal dist



3- select inverse normal



**F5** **F1** **F3** **F2**  $\blacktriangledown$   $\blacktriangledown$  **0** **.** **9** **5** **EXE** **2** **.** **5** **EXE** **1** **6** **8** **EXE** **EXE**

Answer : (c) 163-173

Q.7.

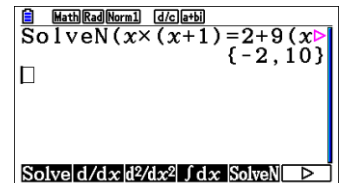
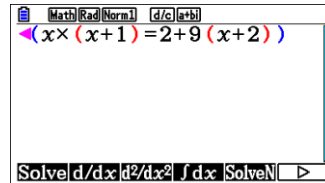
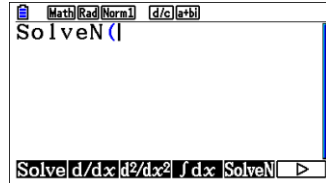
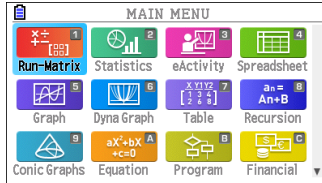
What are three positive consecutive integers when product of the first and second is 2 more than 9 times the third?

ماهي الثلاث اعداد الموجبة والمتعاقبة عندما يكون حاصل ضرب الرقم الأول والثاني هو 2 أكبر من 9 مرات من الرقم الثالث؟

First Integer:  الرقم الأول

Second Integer:  الرقم الثاني

Third Integer:  الرقم الثالث



MENU 1 OPTN F4 F5 X,θ,T X ( X,θ,T + 1 ) SHIFT . 2 + 9 ( X,θ,T + 2 ) ) EXE EXIT

There positive consecutive are :  $x, x+1, x+2$ .

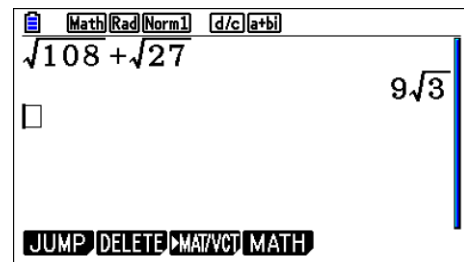
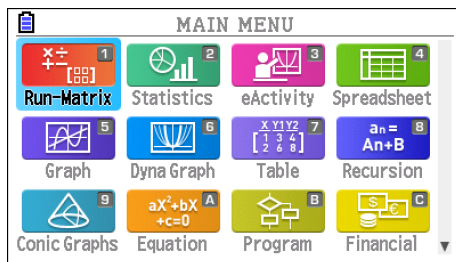
Answer : (10) ,(11) ,(12)

Q.8.

What is the sum of  $\sqrt{27}$  and  $\sqrt{108}$ ?

ماهو حاصل جمع  $\sqrt{27}$  و  $\sqrt{108}$  ؟

- A.
- B.
- C.
- D.



MENU 1 SHIFT x² 1 0 8 ► + SHIFT x² 2 7 EXE

Answer : (b)  $9\sqrt{3}$

**Q.9.** Solve the following system of equations for x and y.

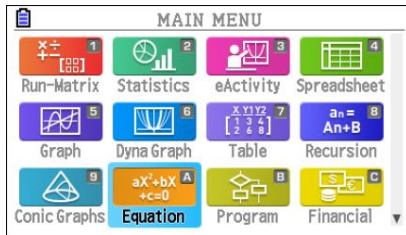
حل المعادلتين الآتيتين لتوجد قيمة كل من X و y.

$$\frac{5}{6}x - \frac{1}{2}y = -5$$

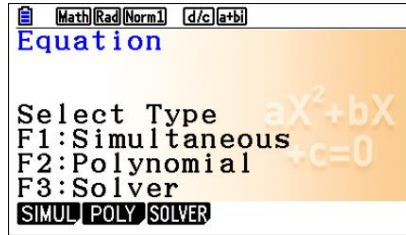
$$-\frac{1}{5}x + \frac{1}{3}y = -2$$

x=

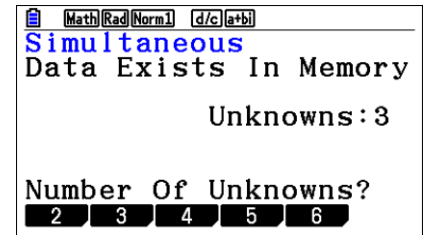
y=



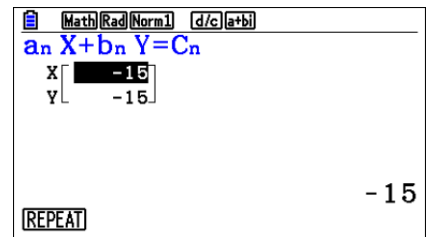
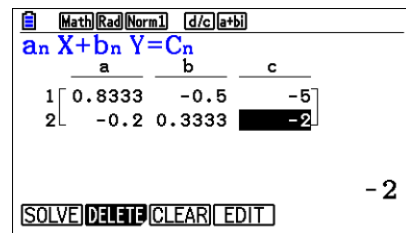
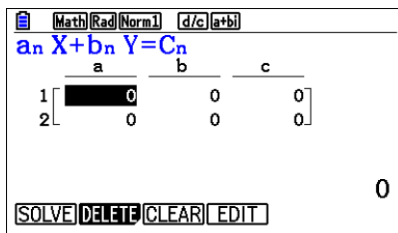
1- select equation



2- choose simultaneous



3- determine the number of unknowns



MENU X,θ,T F1 F1 5 6 EXE - 1 2 EXE -  
5 EXE - 1 5 EXE 1 3 EXE - 2 EXE EXE

Answer : x= -15 , y=-15

**Q.10.**

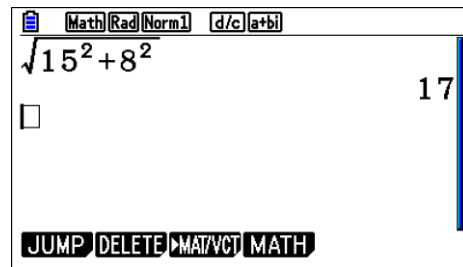
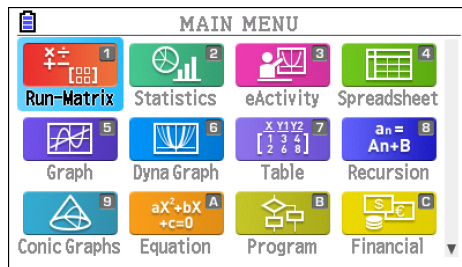
A rhombus has diagonals with lengths 16 and 30.

لدى معين أقطار أطوالها 16 و 30.

What is the length of a side of the rhombus?

ما هو طول أحد أضلاع المعين؟

- A.
- B.
- C.
- D.



**Note:** diagonals are perpendicular so we will use Pythagorean theorem

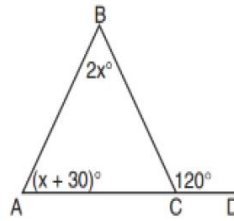
**MENU** **1** **SHIFT** **x²** **1** **5** **x²** **+** **8** **x²** **EXE**

**Answer : (c) 17**

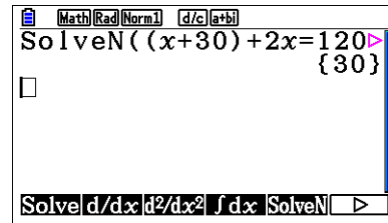
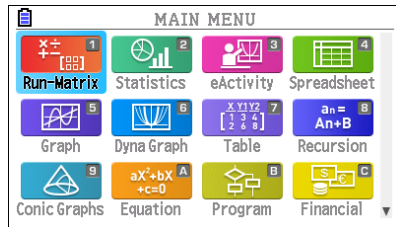
Q.11.

Solve for x.

أوجد قيمة X



x =



MENU 1 OPTN F4 F5 ( X,θ,T + 3 0 ) + 2 X,θ,T SHIFT . 1 2 0 ) EXE EXIT

Answer : x=30

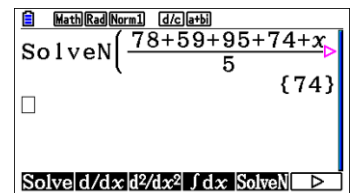
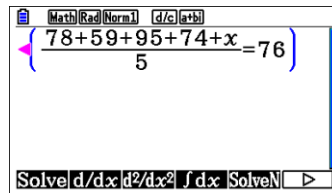
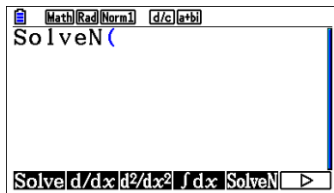
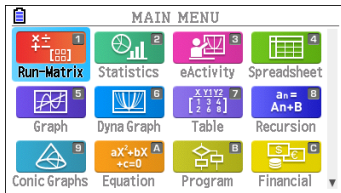
Q.12. Dina has scored 78, 59, 95, and 74 on her last four tests.

حصلت دينا على الدرجات 78، 59، 95، 74 في آخر أربعة اختبارات لها.

What score does she need on her next test so that her average is 76?

ماهي الدرجة التي تحتاجها في اختبارها القادم ليصبح متوسطها الحسابي 76؟

Required score:  الدرجة المطلوبة

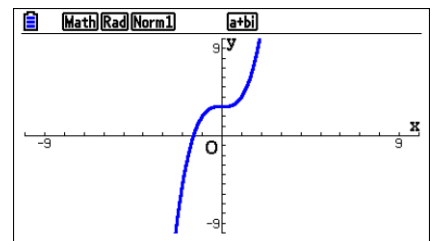
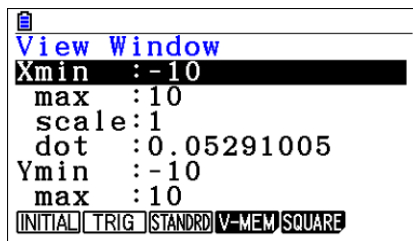
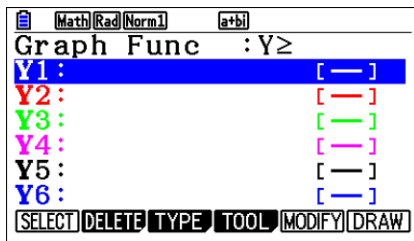
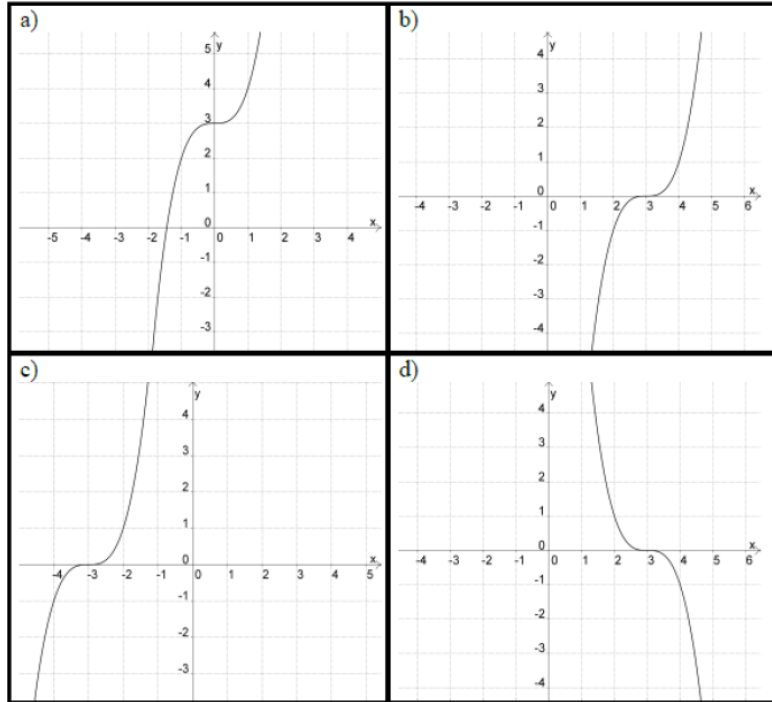


MENU 1 OPTN F4 F5 7 8 + 5 9 + 9 5 + 7 4 + X,θ,T ▼ 5 ► SHIFT . 7 6 ) EXE EXIT

Answer : 74

**Q.13.**

Which of the following is the graph of this function  $f(x) = x^3 + 3$ : اختر الرسم البياني الذي يمثل الدالة:  $f(x) = x^3 + 3$



1- Select the graph mode from the menu, change the type and write the function

2- change view window setting



Answer : (a)

**Q.14.**

Solve the following equations : أوجد الحل للمعادلتين الآتيتين:  $(x, y)$

$$x - 3y = 7$$

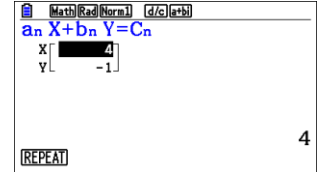
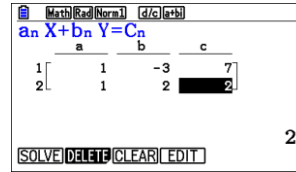
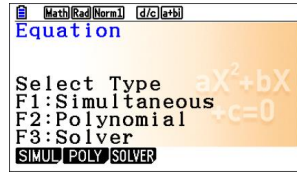
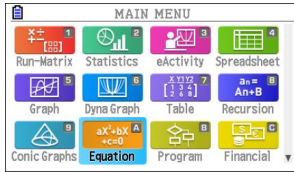
$$x + 2y = 2$$

a)  $(4, -1)$

b)  $(-1, 4)$

c)  $(4, 1)$

d)  $(-1, -4)$



**MENU** **X,θ,T** **F1** **F1** **1** **EXE** **-** **3** **EXE** **7** **EXE** **1** **EXE** **2** **EXE** **2** **EXE**

Answer :  $(4, -1)$

**Q.15.**

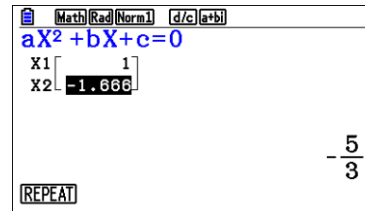
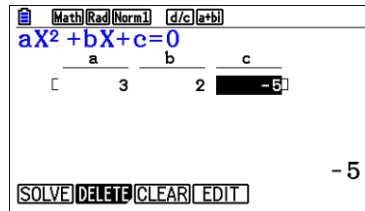
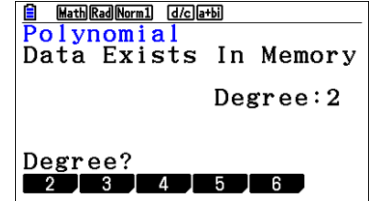
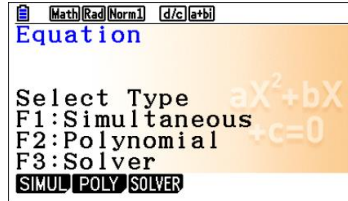
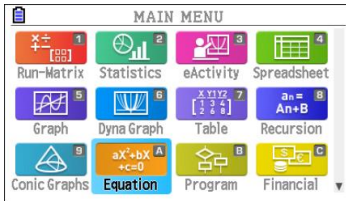
Solve this equation : أوجد مجموعة حل المعادلة:  $3x^2 + 2x - 5 = 0$

a)  $\{1, \frac{5}{3}\}$

b)  $\{-1, \frac{5}{3}\}$

c)  $\{1, -\frac{5}{3}\}$

d)  $\{-1, -\frac{5}{3}\}$



**MENU** **▼** **▼** **▶** **EXE** **F2** **F1** **3** **EXE** **2** **EXE** **-** **5** **EXE** **EXE**

Answer : (c)  $\{1, -\frac{5}{3}\}$

Q.16. Find the value of x

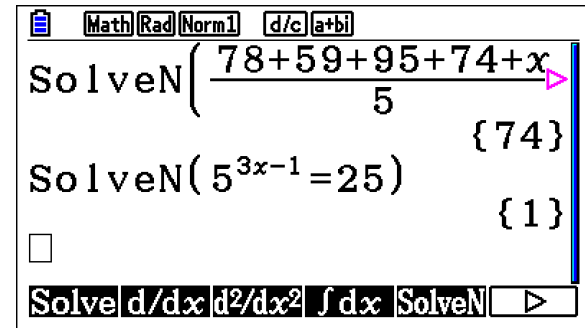
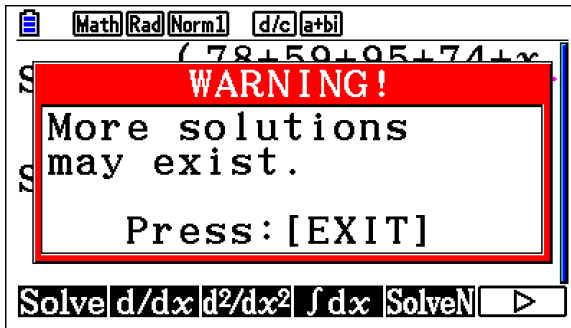
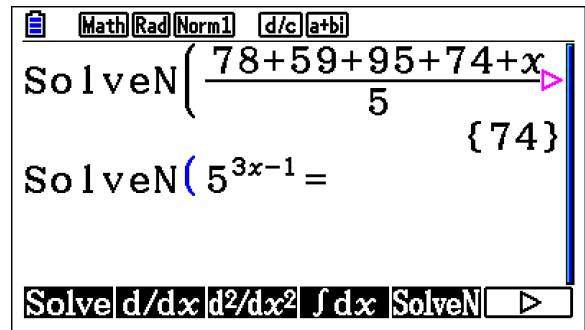
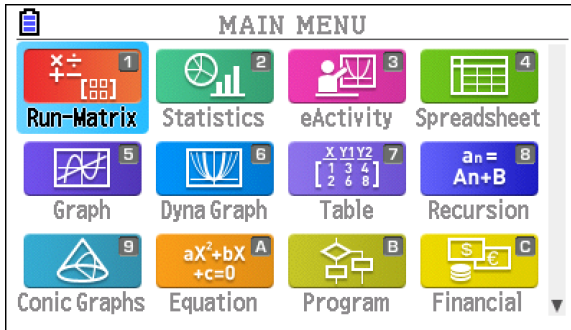
أوجد قيمة  $x$  في المعادلة:  $5^{3x-1} = 25$

a) 1

b) -1

c) 2

d)  $\frac{1}{3}$



**MENU** **1** **OPTN** **F4** **F5** **5** **^** **3** **X,θ,T** **=** **1** **▶** **SHIFT** **•** **2** **5** **)** **EXE** **EXIT**

Answer : (a) 1

**Q.17.** A company makes aluminum boxes in the shape of a box with a half-cylinder top.

تقوم شركة بصناعة صناديق من الألمنيوم بشكل صندوق له قمة ذات شكل نصف اسطواني.

The company will make 1857 boxes this week.

ستصنع الشركة 1857 صندوق في هذا الأسبوع.

If each box has the dimensions shown below, how many square meters of aluminum will be needed to make these boxes?

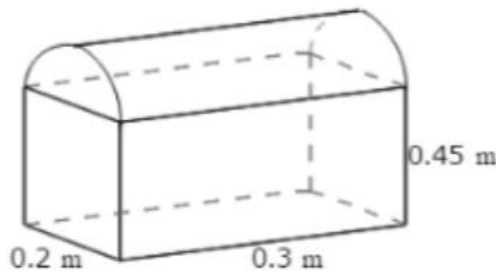
إذا كان لدى الصندوق أبعاد كما هو موضح بالشكل أدناه، ماهي المساحة الإجمالية لألواح الألمنيوم بالمتر المربع، التي ستحتاجها الشركة لصناعة الصناديق؟

Use 3.14 for  $\pi$ .

استخدم 3.14 لـ  $\pi$ .

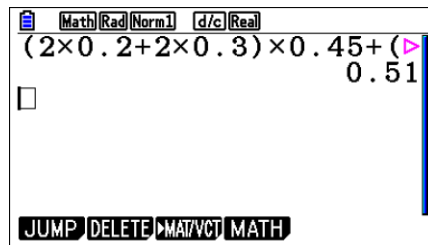
Round your answer to the nearest square meter.

قرب اجابتك لأقرب متر مربع.



Total area of aluminum sheets needed:  الكمية المطلوبة من الألمنيوم:

The total area for the shape is total area for the rectangular and half cylinder  $A = (2x + 2y)h + xy + 1/2(2\pi ry + 2\pi r^2)$



Rectangular area

