

Getting the Most of Your TI-84 CE Graphing Calculator

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Middle Grades Math:

- Fractions
- proportions

Pretty Fractions (vs. Ugly Fractions)

NORMAL FLOAT AUTO a+bi RADIAN MP 

12/36


0.3333333333

Ans \rightarrow Frac

$\frac{12}{36}$

$\frac{1}{3}$

$\frac{1}{3}$

NORMAL FLOAT AUTO a+bi RADIAN MP 

1+4/5

1.8

Ans \rightarrow Frac

$\frac{9}{5}$

1 $\frac{4}{5}$ \rightarrow Dec

1.8

Simplifying Fractions

$$\frac{24}{27}$$

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

$$\frac{25}{27}$$

$$\frac{25}{27}$$

$$1\frac{6}{10}$$

$$\frac{8}{5}$$

Ans ▸ n/d ◀ ▸ Un/d

$$1\frac{3}{5}$$

Converting from fractions to decimals and vice versa

$$\frac{4}{9} \qquad 0.4444444444$$

$$\frac{5}{9} \qquad \frac{4}{9}$$

$$\frac{5}{9} \qquad 0.4444444444$$

$$\frac{5}{9} \triangleright F \triangleleft \triangleright D \qquad 0.4444444444$$

Converting from fractions to decimals and vice versa

.44 ▶ F ◀ ▶ D

$$\frac{11}{25}$$

.4444444444 ▶ F ◀ ▶ D

$$\frac{4}{9}$$

Operating with fractions

$$\frac{1}{2} - \frac{1}{3}$$

$$\frac{1}{6}$$

$$\frac{1}{2} + \frac{1}{3}$$

$$\frac{5}{6}$$

$$\frac{1}{2} \times \frac{1}{3}$$

$$\frac{1}{6}$$

$$\frac{1}{2} \div \frac{1}{3}$$

$$\frac{3}{2}$$

- “Old School” method for solving proportions

Something weighing 160 pounds on Earth is 416 pounds on Jupiter. If something weighs 120 pounds on Earth, how many pounds would it weigh on Jupiter?

$$\frac{\text{Earth}}{\text{Jupiter}} = \frac{160}{416} = \frac{120}{x}$$

$$160x = 416 * 120$$

$$x = \frac{416 * 120}{160}$$

$$x = 312$$

Ratio Tables

Something weighing 160 pounds on Earth is 416 pounds on Jupiter. If something weighs 120 pounds on Earth, how many pounds would it weigh on Jupiter?

(b)

Earth weight	160	80	40	120
Jupiter weight	416	208	104	312

add

CELLSHEET APP				
S01	A	B	C	D
1	160	416		
2	80	208		
3	40	104		
4	120	312		
5				
6				
7				
8				
9				
10				
11				
A6:				
[RANGE]		[PASTE] [MENU]		

Ratio Tables

(a)

Earth weight	160	80	40	120
Jupiter weight	416	208	104	312

Diagram (a) shows a ratio table with four columns. The first column lists the weights. The second column (160, 416) is derived from the first (80, 208) by multiplying by 2. The third column (80, 208) is derived from the second (40, 104) by multiplying by 2. The fourth column (40, 104) is derived from the third (120, 312) by multiplying by 3. Blue arrows and labels indicate these operations: $\div 2$ from 160 to 80, $\div 2$ from 80 to 40, and $\times 3$ from 40 to 120.

(b)

Earth weight	160	80	40	120
Jupiter weight	416	208	104	312

Diagram (b) shows a ratio table with four columns. The first column lists the weights. The second column (160, 416) is derived from the first (80, 208) by multiplying by 2. The third column (80, 208) is derived from the fourth (40, 104) by multiplying by 2. The fourth column (40, 104) is derived from the third (120, 312) by multiplying by 3. Blue arrows and labels indicate these operations: $\div 2$ from 160 to 80, $\div 2$ from 80 to 40, and $\times 3$ from 40 to 120.

(c)

Earth weight	160	20	100	120
Jupiter weight	416	52	260	312

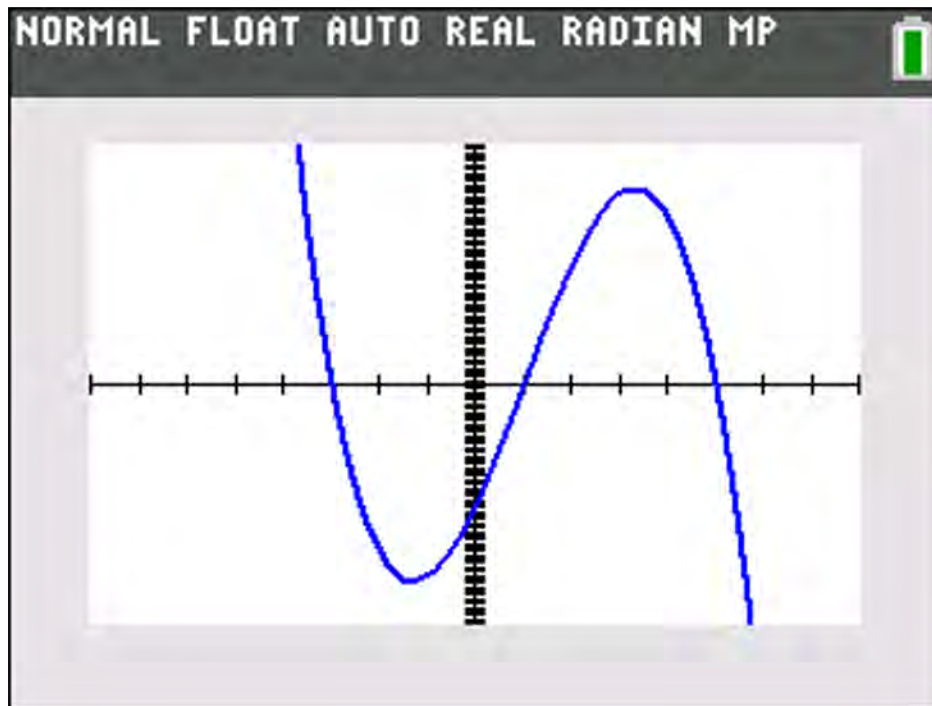
Diagram (c) shows a ratio table with four columns. The first column lists the weights. The second column (160, 416) is derived from the first (20, 52) by multiplying by 8. The third column (20, 52) is derived from the fourth (100, 260) by multiplying by 5. The fourth column (100, 260) is derived from the third (120, 312) by multiplying by 5. Blue arrows and labels indicate these operations: $\div 8$ from 160 to 20, $\div 5$ from 100 to 20, and $\times 5$ from 20 to 100.

Algebra I and II

- polynomial functions
- rational functions

Turning Points/Extrema/ Inc&Dec/Intercepts

$$Y_1 = -2X^3 + 6X^2 + 26X - 30$$



window
and
zoom options
and
calc
(2nd trace: min,
max, zero)

End Behavior $Y_1 = -2X^3 + 6X^2 + 26X - 30$

homescreen

NORMAL FLOAT AUTO REAL RADIAN MP	
Y ₁ (100)	-1937430
Y ₁ (500)	-248487030
Y ₁ (1000)	-1993974030

NORMAL FLOAT AUTO REAL RADIAN MP	
TABLE SETUP	
TblStart=0	
ΔTbl=1	
Indpnt: Auto	Ask
Depend: Auto	Ask

table
and
tblset

NORMAL FLOAT AUTO REAL RADIAN MP					
X	Y ₁				
100	-1.9E6				
1000	-2E9				
10000	-2E12				
100000	-2E15				
1E6	-2E18				

X=

Quadratic Formula

```
PROGRAM: QUADFORM
: Prompt A, B, C
: ( -B+√(B²-4AC) ) / (2A) → M
: ( -B-√(B²-4AC) ) / (2A) → N
: Disp M, N
```

```
prgmQUADFORM
A=?1
B=?0
C=? -4
```

2
-2
Done

```
prgmQUADFORM
A=?1
B=?0
C=?4
```

2i
-2i
Done

```
prgmQUADFORM
A=?1
B=?0
C=? -5
```

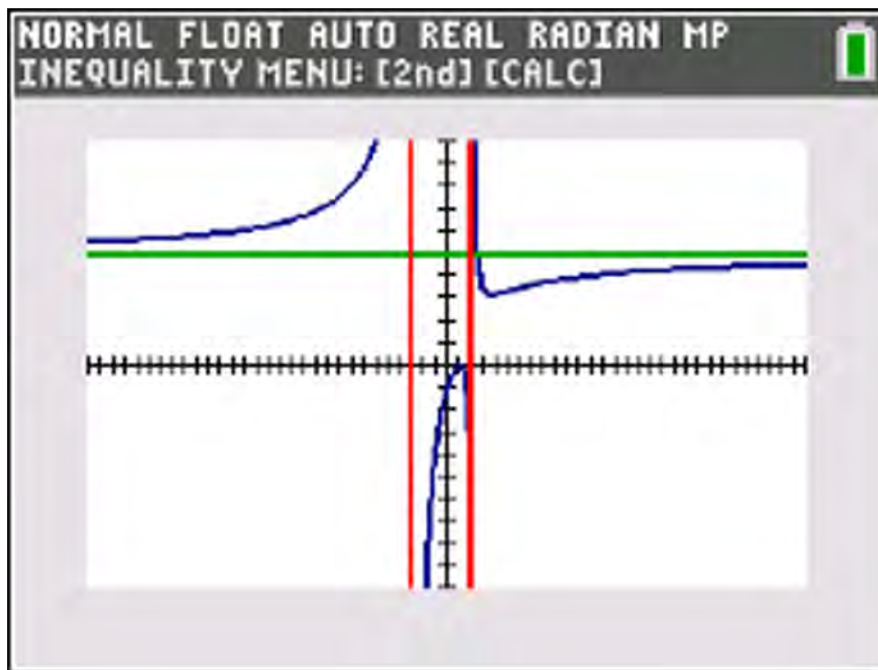
2.236067977
-2.236067977
Done

√5

2.236067977

Rational Functions

$$Y_2 = \frac{5(X-1)^2}{(X-2)(X+3)}$$



Asymptotes
End Behavior

Inequalz App

Asymptotes

$$\blacksquare Y_2 = \frac{5(X-1)^2}{(X-2)(X+3)}$$

$$\blacksquare Y_3 = 5$$

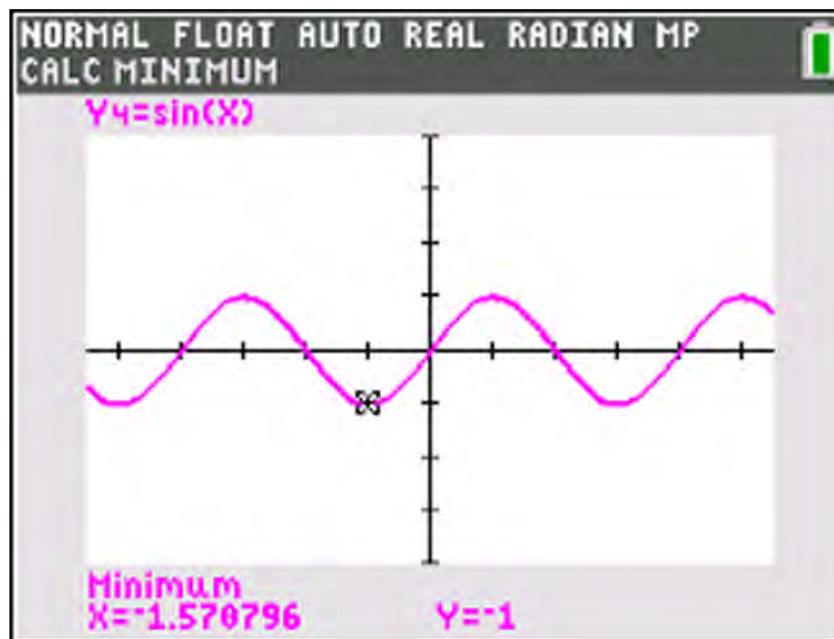
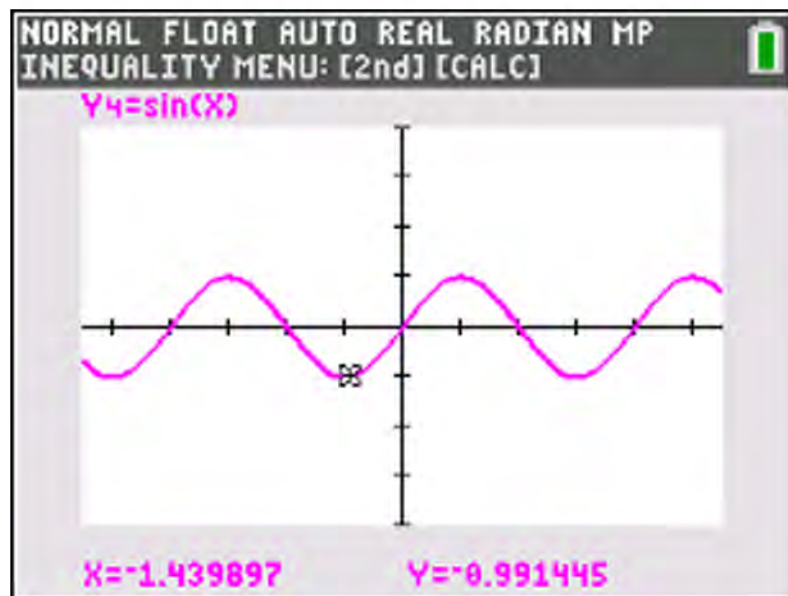
$$\blacksquare X_1 = 2$$

$$\blacksquare X_2 = -3$$

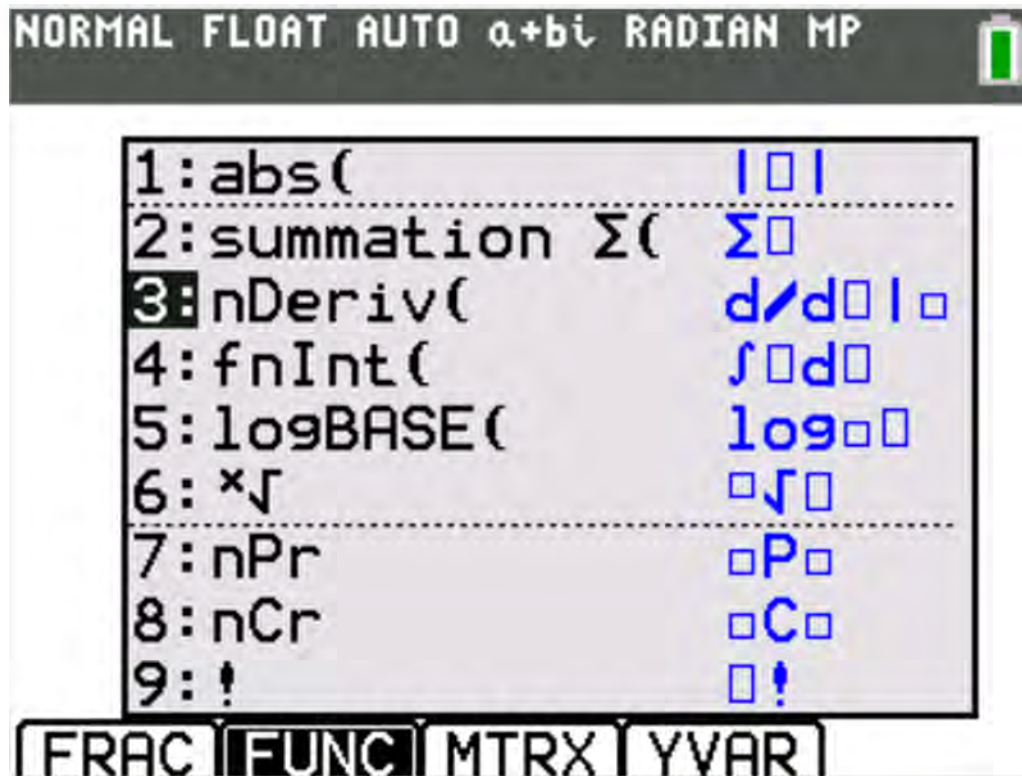
Precalculus/Calculus

- Extrema
- Limits

Extrema Graphically



Numerical Derivative



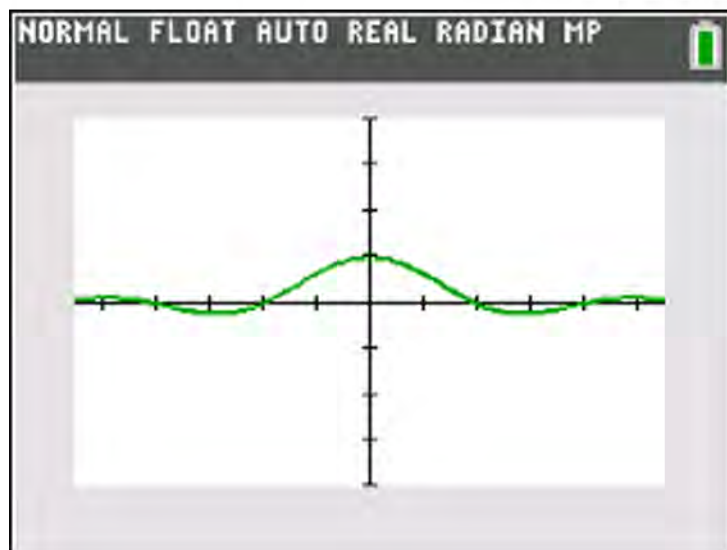
$$\frac{d}{dx}(Y_4) \big|_{x=-\pi/2}$$

0

Limits

$$\lim_{x \rightarrow 0} \left(\frac{\sin x}{x} \right)$$

$$\boxed{\sin(X)} \div \boxed{X}$$



NORMAL FLOAT AUTO REAL Radian MP
PRESS + FOR ΔTb1

X	Y5				
-5	-0.192				
-4	-0.189				
-3	0.047				
-2	0.4546				
-1	0.8415				
0	ERROR				
1	0.8415				
2	0.4546				
3	0.047				
4	-0.189				
5	-0.192				

X = -5

NORMAL FLOAT AUTO REAL Radian MP
PRESS + FOR ΔTb1

X	Y5				
-0.5	0.9589				
-0.4	0.9735				
-0.3	0.9851				
-0.2	0.9933				
-0.1	0.9983				
0	ERROR				
0.1	0.9983				
0.2	0.9933				
0.3	0.9851				
0.4	0.9735				
0.5	0.9589				

X = -0.5

NORMAL FLOAT AUTO REAL Radian MP
PRESS → TO EDIT FUNCTION

X	Y5				
-0.05	0.9996				
-0.04	0.9997				
-0.03	0.9999				
-0.02	0.9999				
-0.01	1				
0	ERROR				
0.01	1				
0.02	0.9999				
0.03	0.9999				
0.04	0.9997				
0.05	0.9996				

Y5 = 0.99998333341667

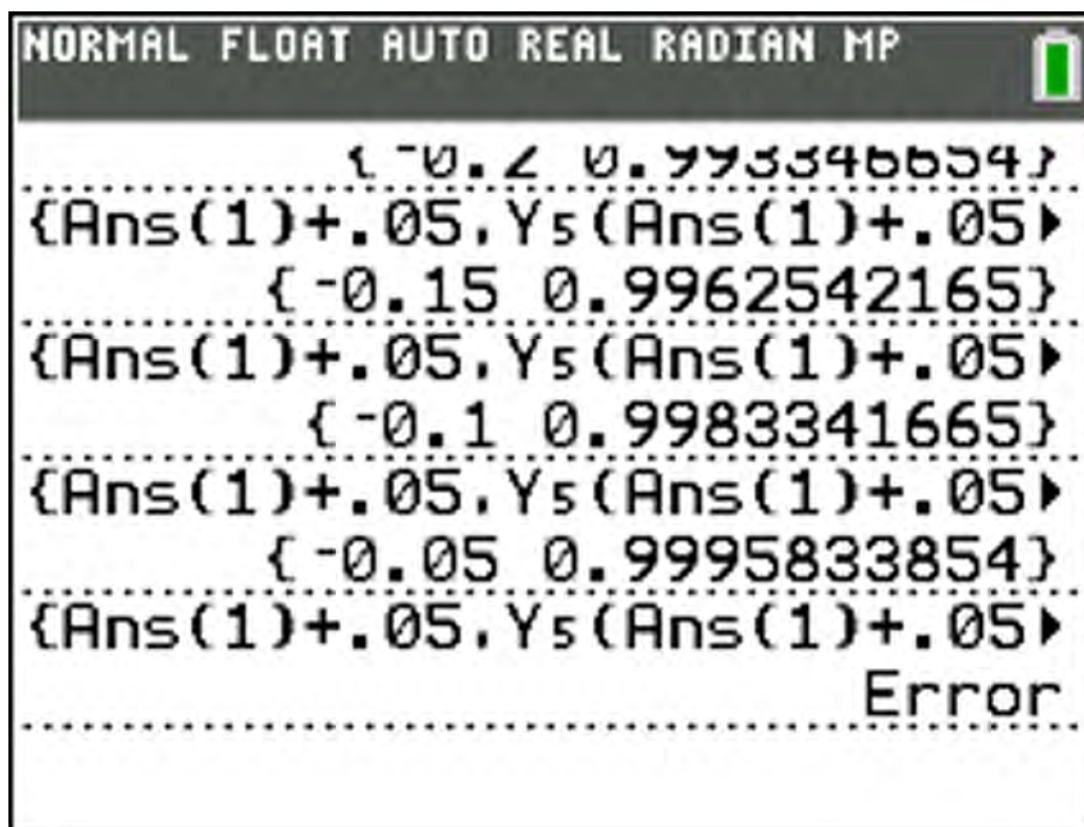
evaluating on Homescreen

$$\boxed{\text{Y5}} \boxed{= \frac{\sin(X)}{X}}$$

```
{-.5,Y5(-.5)} Y5(Ans(1)+.05)}  
{-0.5 0.9588510772}  
{Ans(1)+.05,Y5(Ans(1)+.05)}  
{-0.45 0.9665900758}
```

evaluating on Homescreen

$$\boxed{\text{Y5}} = \frac{\sin(X)}{X}$$



Geometry

- area of rectangle with fixed perimeter
- perimeter of rectangle with fixed area
- slope between two points
- distance between two points

perimeter of rectangle with fixed area

At the local craft fair,
the rectangular
displays must have an
area of 16 sq. meters .

- What dimensions
can he use?
- What dimensions
would minimize the
amount of materials he
needs to border his
display?

$$A = l * w$$

$$16 = l * w$$

$$l = \frac{16}{w}$$

$$P = 2l + 2w$$

$$P = 2\left(\frac{16}{w}\right) + 2w$$

$$P = \frac{32}{w} + 2w$$

area of rectangle with fixed perimeter

CELLSHEET APP

FIXED A	A	B	C	D
1	LENGTH"	WIDTH"	PERIMETER"	
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				

A1: "LENGTH"
[RANGE] [HELP] [MENU]

area of rectangle with fixed perimeter

Mia purchased an underground dog fence that includes 500 feet of wire. She wants to fence in a rectangular region using all of the wire.

- What dimensions could Mia use to construct her fence?
- What is the area of each region?
- What dimensions maximize the area?

All dimensions must be a whole number of feet.

$$P = 2l + 2w = 500$$

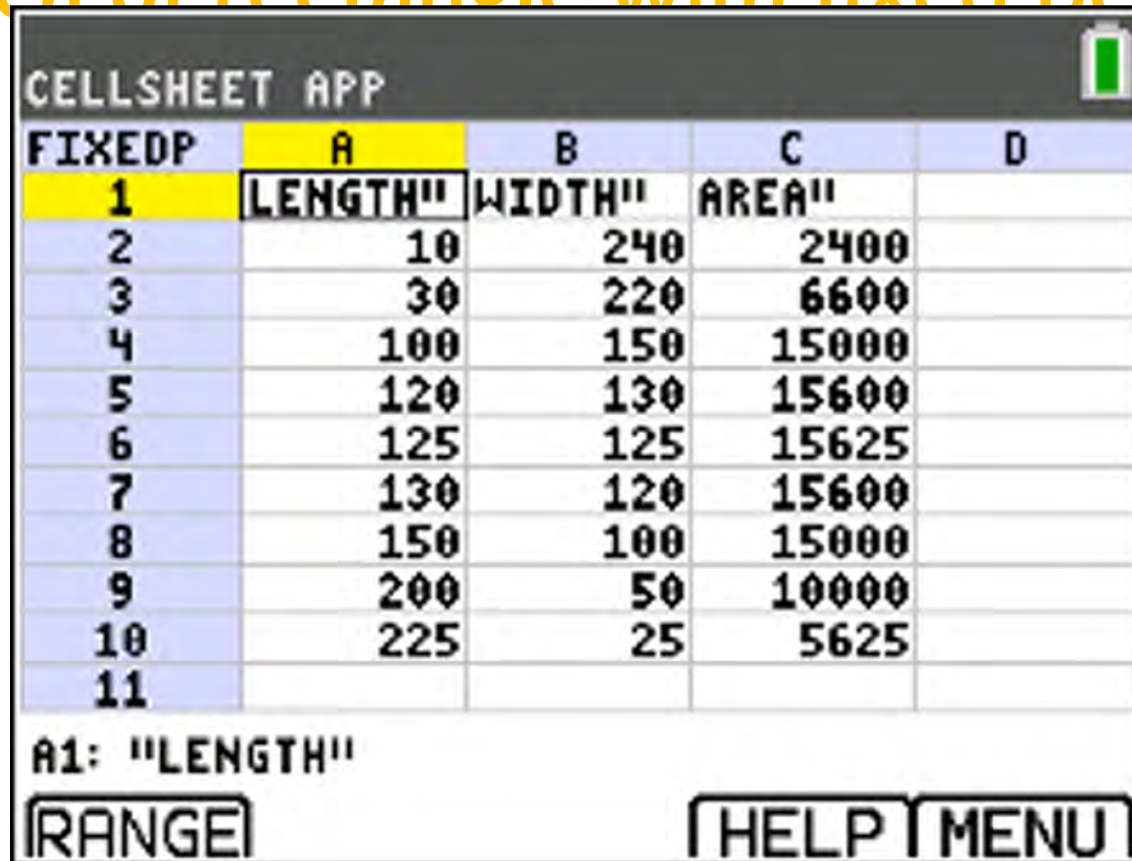
$$l + w = 250$$

$$w = 250 - l$$

$$A = l * w$$

$$A = l * (250 - l)$$

area of rectangle with fixed perimeter



The screenshot shows a handheld calculator interface titled "CELLSHEET APP". It features a table with 5 columns: "FIXEDP", "A", "B", "C", and "D". The first row of the table is highlighted in yellow and contains the headers "1", "LENGTH", "WIDTH", "AREA", and an empty cell. The subsequent rows (2-11) contain numerical data. The values in column "A" (LENGTH) are 10, 30, 100, 120, 125, 130, 150, 200, and 225. The values in column "B" (WIDTH) are 240, 220, 150, 130, 125, 120, 100, 50, and 25. The values in column "C" (AREA) are 2400, 6600, 15000, 15600, 15625, 15600, 15000, 10000, and 5625. The interface also includes a status bar at the bottom with the text "A1: 'LENGTH'", a "RANGE" button, and a "HELP MENU" button. A battery icon is visible in the top right corner of the app window.

FIXEDP	A	B	C	D
1	LENGTH	WIDTH	AREA	
2	10	240	2400	
3	30	220	6600	
4	100	150	15000	
5	120	130	15600	
6	125	125	15625	
7	130	120	15600	
8	150	100	15000	
9	200	50	10000	
10	225	25	5625	
11				

A1: "LENGTH"
[RANGE] [HELP MENU]

(10, 6) and (6, 9)

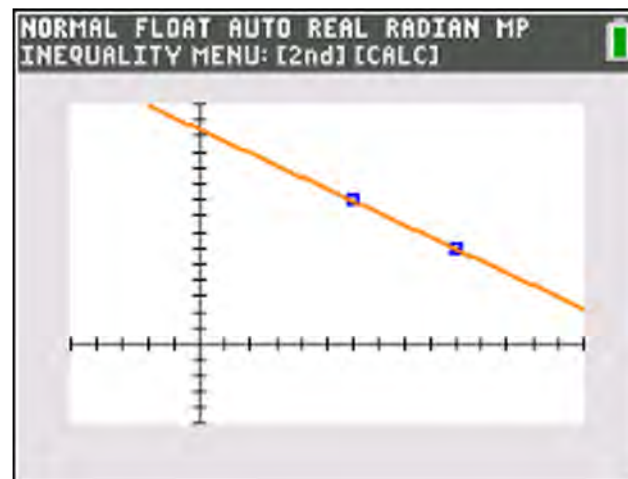
Slope (and y-intercept)

```
NORMAL FLOAT AUTO REAL RADIAN MP
EDIT MENU: [alpha] [f5]

PROGRAM: SLOPE
:ClrHome
:Prompt A,B,C,D
: (B-D)/(A-C)→E
:Disp "SLOPE IS"
:Disp E→Frac
:B-EA→F
:Disp "Y INTERCEPT IS"
:Disp F→Frac
:■
```

```
NORMAL FLOAT AUTO REAL RADIAN MP

H=?10
B=?6
C=?6
D=?9
SLOPE IS
                                     -3/4
Y INTERCEPT IS
                                     27/2
..... Done
■
```



(10, 6) and (6, 9)

```
NORMAL FLOAT AUTO REAL Radian MP
EDIT MENU: [alpha] [f5]

PROGRAM: DISTANCE
: Input A, B, C, D
:  $\sqrt{(D-B)^2 + (C-A)^2} \rightarrow E$ 
: Disp E
: █
```

PrgrmDISTANCE

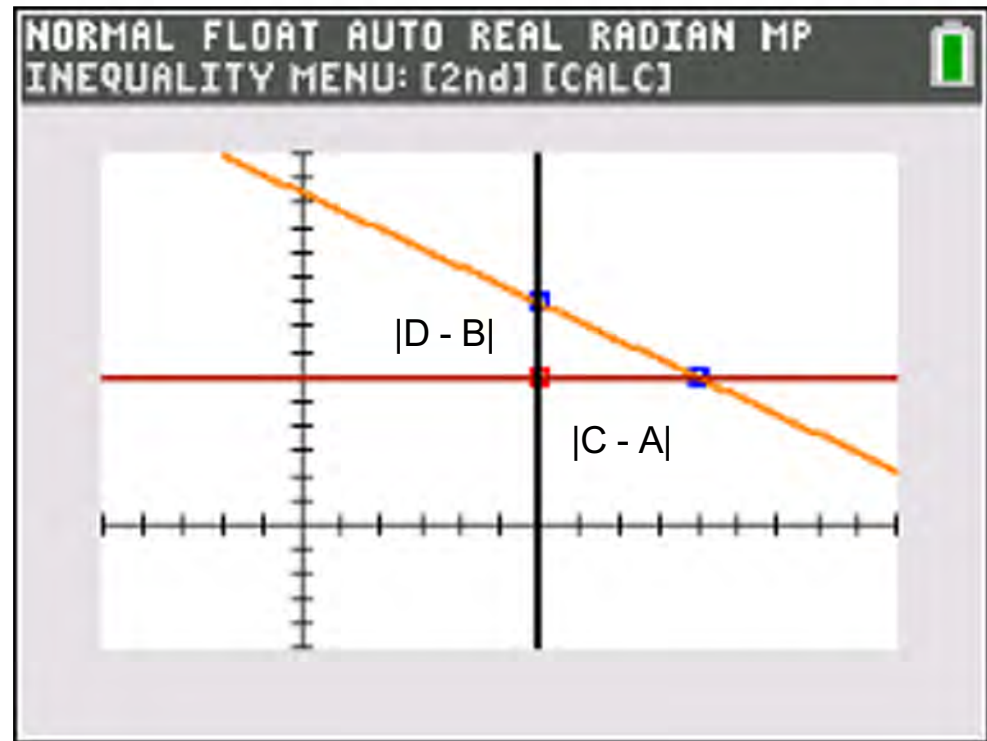
A=?10

B=?6

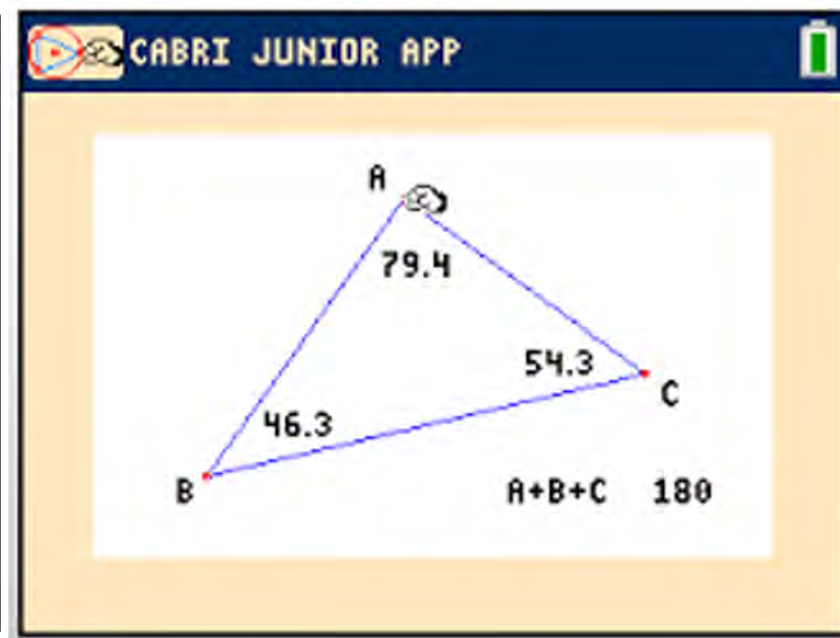
C=?6

D=?9

5
Done



Future Learning: Cabri Jr



What is one thing you learned today that you think you will take back and use in your classroom?

What are some activities that we have explored that you would like to explore more on your own?

NORMAL FLOAT AUTO REAL MODE
PRESS ENTER TO EDIT



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TI-84 Plus family

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10 Minutes of Code

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Start Here

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**Feel free to contact us about
any questions or any materials
you would like us to share.**

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