Introduction to the graphing calculator

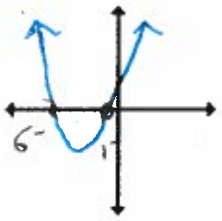
Using a Graphing Calculator to Graph a Function

*Verify the calculator window is in standard setting by pressing **ZOOM** → **6:ZStandard**

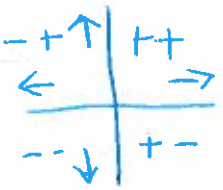
* The equation $y = x^2 + 7x + 6$ will be used to illustrate the graphing feature.

$(x+6)(x+1)$ $x = -6, -1$

1. Enter the equation into **Y=** and press **GRAPH**
2. Sketch the graph



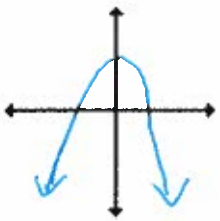
Window
Xmin = ←
Xmax = →
Ymin = ↓
Ymax = ↑



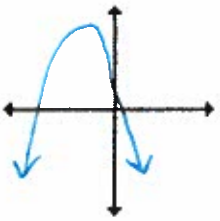
3. If the entire graph isn't visible it will be necessary to adjust the window setting using the **WINDOW** button. Using trial and error until the correct window setting is found.

Class Ex. #1 Graph the following functions using a graphing calculator.

a) $y = -x^2 + 3x + 5$

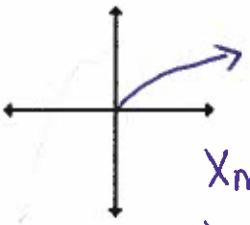


b) $y = 8 - 31x - 4x^2$

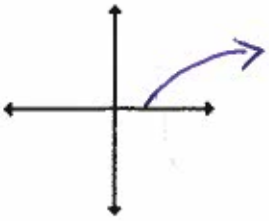


*always write changes to window for sketch
Xmin -10
Xmax 2
Ymin -10
Ymax 70

c) $y = \sqrt{x}$



d) $y = \sqrt{x-2}$



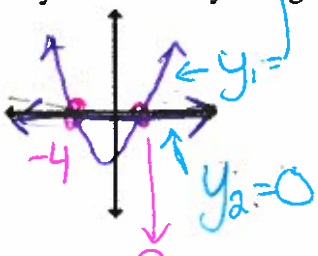
Xmin 0
Xmax 10
Ymin 0
Ymax 10
} same

Using a Graphing Calculator to Determine the Zeros of a Function

*Verify the calculator window is in standard setting by pressing ZOOM → 6:ZStandard

* The equation $x^2+2x-8=0$ will be used to illustrate the intersect feature.

1. Enter the equation x^2+2x-8 into $Y_1=$ and enter 0 into $Y_2=$ and press **GRAPH**.
   Why is there only one graph shown?



y=0 then thats the x-axis

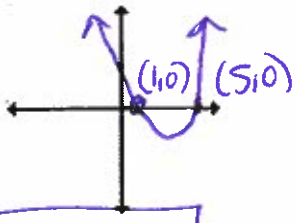
x^2+2x-8 x| +
$(x+4)(x-2)$ -8| 2

X=-4, 2

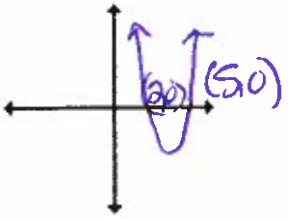
2. Access the CALC menu by entering **2nd** then **TRACE**.
3. Select **5: intersect**
4. On the bottom of the screen the calculator will ask you for a First curve?. Notice the equation of Y_1 at the top of the screen. Press **ENTER**.
5. On the bottom of the screen the calculator will ask you for a Second curve?. Notice the equation of Y_2 at the top of the screen. Press **ENTER**.
6. The bottom of the screen will ask you for a Guess?. Press **ENTER**.
   The x value is the x-intercept.
7. Repeat steps 2 - 6 to find the second x-intercept

Class Ex. #2 Graph the following functions using a graphing calculator and find the x-intercept(s).

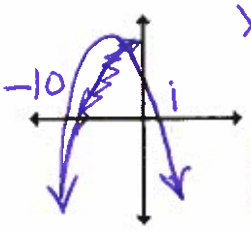
a) $y=x^2-6x+5$ b) $y=2x^2-14x+20$ c) $y=-5x^2-45x+50$



X=1,5



X=2,5



Xmin -15
Xmax 2
Ymin -10
Ymax 160

X=-10, 1

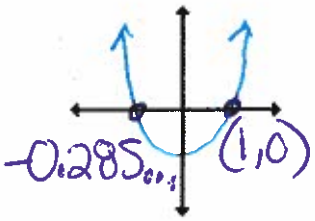
2nd TRACE 2: zero left bound, right bound

Using a Graphing Calculator to Determine the exact value of a Zeros of a Function

*Verify the calculator window is in standard setting by pressing ZOOM → 6:ZStandard

* The equation $7x^2 - 5x - 2 = 0$ will be used to illustrate the intersect feature.

1. Enter the equation $7x^2 - 5x - 2$ into $Y_1 =$, enter 0 into $Y_2 =$ and press **GRAPH**



Xmin -2
Xmax 2
Ymin -10
Ymax 10

2. Find the intercepts. If one of the answers is a decimal value we are going to find the fraction equivalent.

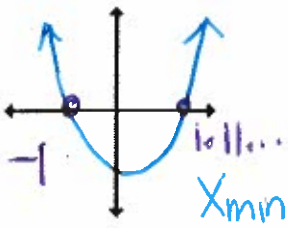
3. With that decimal value found, exit the graphing screen.... press **CLEAR**
4. Bring up the x value we just found.... press **X, T, θ , n** and **ENTER**

5. Change this to a fraction... press **MATH** and select **1: Frac**

$$\frac{-2}{7}$$

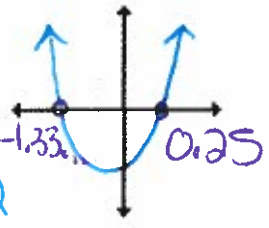
Class Ex. #3 Graph the following functions using a graphing calculator and find the x-intercept(s) as exact values

a) $9x^2 - x - 10 = 0$ b) $12x^2 + 13x - 4 = 0$ c) $6x^2 + 7x + 2 = 0$

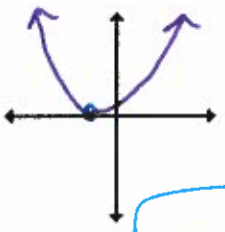


Xmin -2
Xmax 2
Ymin -15
Ymax 10

$X = -1, \frac{10}{9}$



$X = -\frac{4}{3}, \frac{1}{4}$

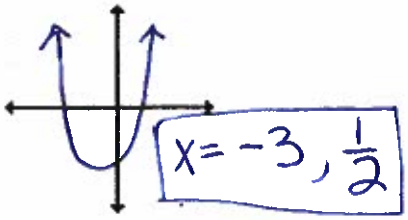


$X = -\frac{2}{3}$

Assignment

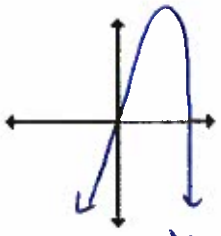
Graph the following functions using a graphing calculator. Sketch your graph. Find the intercepts for each graph, as exact values.

a) $2x^2+5x-3=0$



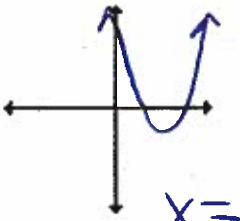
$x=-3, \frac{1}{2}$

b) $25x-5x^2=0$



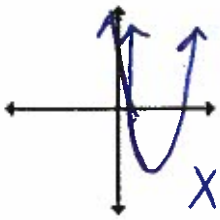
$x=0, 5$

c) $x^2-7x+10=0$



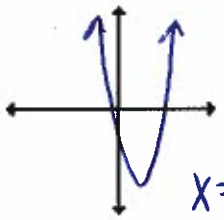
$x=2, 5$

d) $3x^2-10x+3=0$



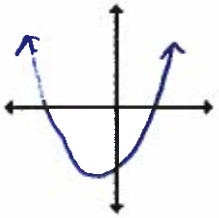
$x=\frac{1}{3}, 3$

e) $6x^2-19x-7=0$



$x=-\frac{1}{3}, \frac{7}{2}$

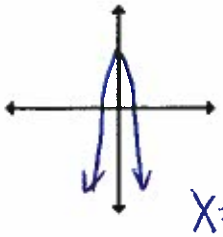
f) $x^2+5x-84=0$



$x=-12, 7$

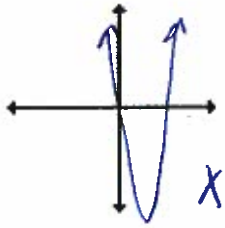
$x_{min}=-20$
$x_{max}=10$
$y_{min}=-100$
$y_{max}=10$

g) $6-7x-20x^2=0$



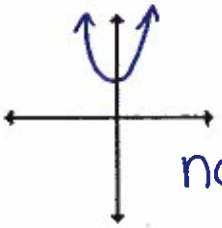
$x=\frac{2}{5}, -\frac{3}{4}$

h) $24x^2-53x-7$



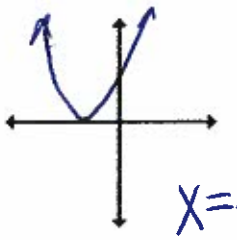
$x=-\frac{1}{8}, \frac{7}{3}$

i) $5x^2+x+3=0$



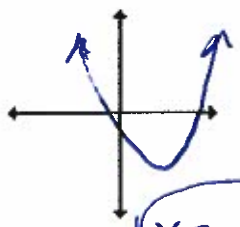
no x-ints

j) $x^2+6x+9=0$



$x=-3$

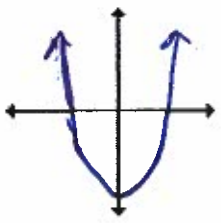
k) $f(x)=x^2-13x-30$



$x_{min}=-10$
$x_{max}=20$
$y_{min}=-100$
$y_{max}=10$

$x=-2, 15$

l) $f(x)=81x^2-400$



$x_{min}=-5$
$x_{max}=5$
$y_{min}=-400$
$y_{max}=50$

$x=-\frac{20}{9}, \frac{20}{9}$