

Week 2 Agenda

Review Quiz 1

Lecture Polynomials

Classwork Week 1/2

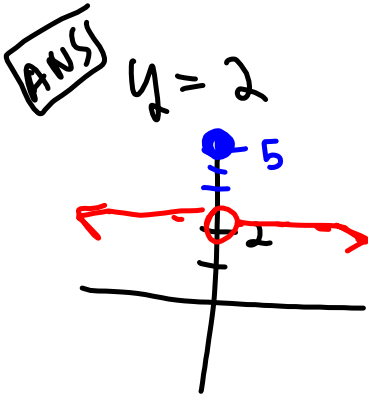
Preview Quiz 2

Review Quiz #1

Suppose that the function g is defined, for all real numbers, as follows.

$$g(x) = \begin{cases} 2 & \text{if } x \neq 0 \\ 5 & \text{if } x = 0 \end{cases}$$

Graph the function g .



Identifying functions from relations

For each relation, decide whether or not it is a function.

<p>Relation 1</p> <table border="0"> <thead> <tr> <th>Domain</th> <th>Range</th> </tr> </thead> <tbody> <tr> <td>leaf</td> <td>4</td> </tr> <tr> <td>rock</td> <td>-2</td> </tr> <tr> <td>rock</td> <td>-1</td> </tr> <tr> <td>pen</td> <td>-8</td> </tr> <tr> <td>pen</td> <td>9</td> </tr> </tbody> </table> <p><input type="radio"/> Function <input checked="" type="radio"/> Not a function</p>	Domain	Range	leaf	4	rock	-2	rock	-1	pen	-8	pen	9	<p>Relation 2</p> <table border="0"> <thead> <tr> <th>Domain</th> <th>Range</th> </tr> </thead> <tbody> <tr> <td>4</td> <td>-2</td> </tr> <tr> <td>4</td> <td>-1</td> </tr> <tr> <td>4</td> <td>-8</td> </tr> <tr> <td>4</td> <td>9</td> </tr> <tr> <td>4</td> <td>4</td> </tr> </tbody> </table> <p><input type="radio"/> Function <input checked="" type="radio"/> Not a function</p>	Domain	Range	4	-2	4	-1	4	-8	4	9	4	4
Domain	Range																								
leaf	4																								
rock	-2																								
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4	4																								
<p>Relation 3</p> <p>$\{(f, u), (j, f), (u, u), (n, u)\}$</p> <p><input type="radio"/> Function <input checked="" type="radio"/> Not a function</p>	<p>Relation 4</p> <p>$\{(-5, m), (-5, r), (8, r), (1, r)\}$</p> <p><input type="radio"/> Function <input checked="" type="radio"/> Not a function</p>																								

Dish \rightarrow Clean Dish
Dish \rightarrow Dirty Dish



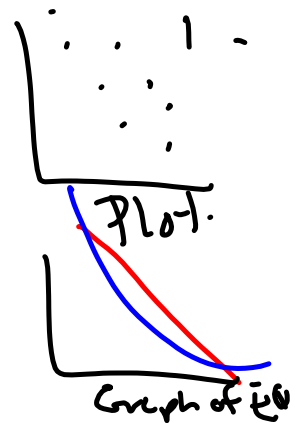
Lecture Polynomials

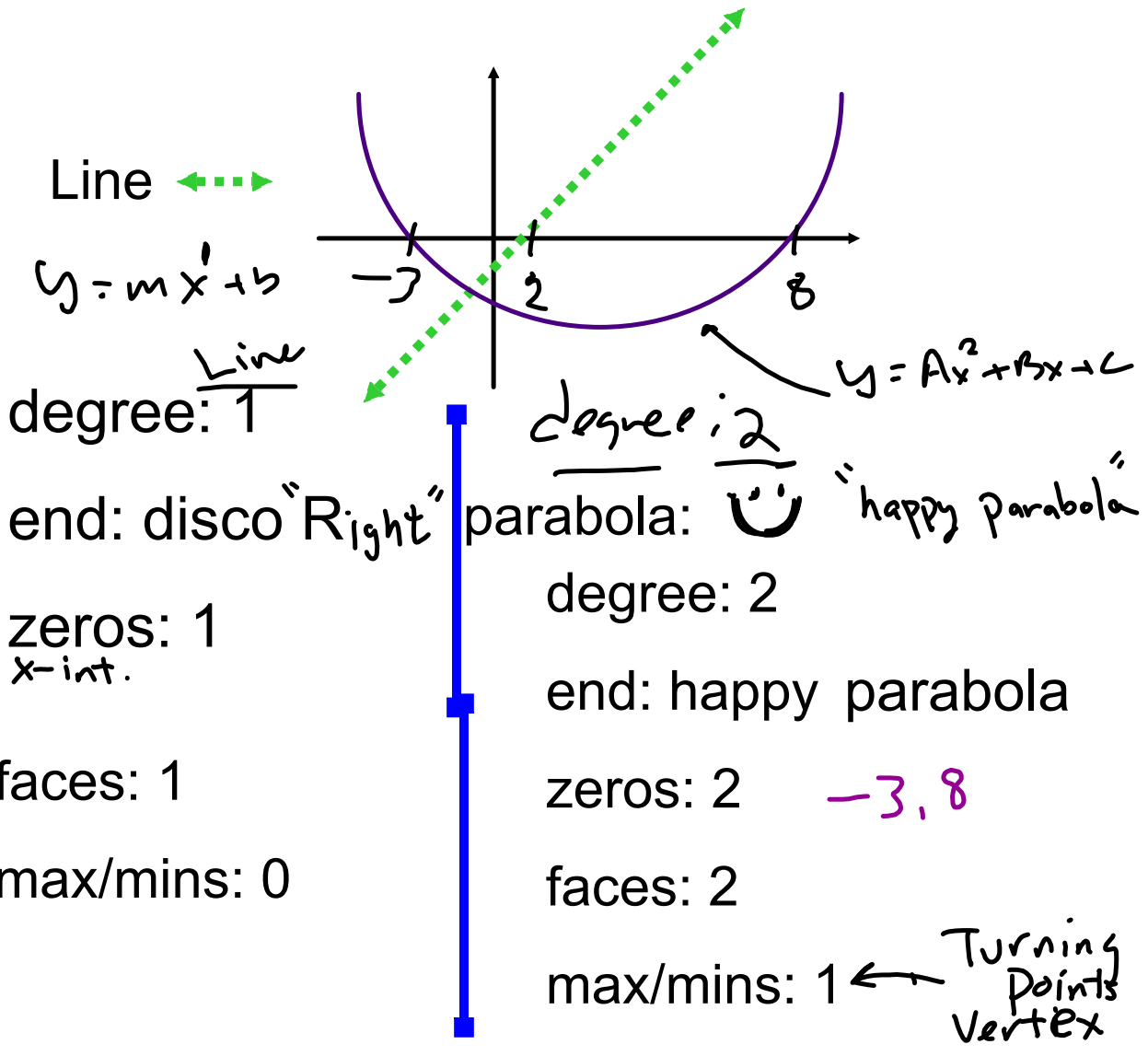
Math = Language
Pre-cal. = Study of Function
Function (job)

in = domain
out = range

1. Data
2. Graph
3. Equation
- (4. words)

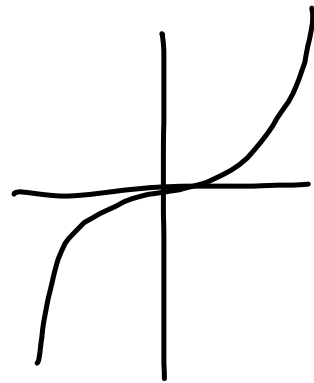
(x, y)
Linear, Quad









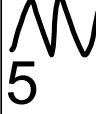
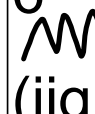



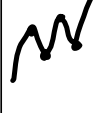
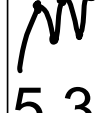
$$y = x^3$$

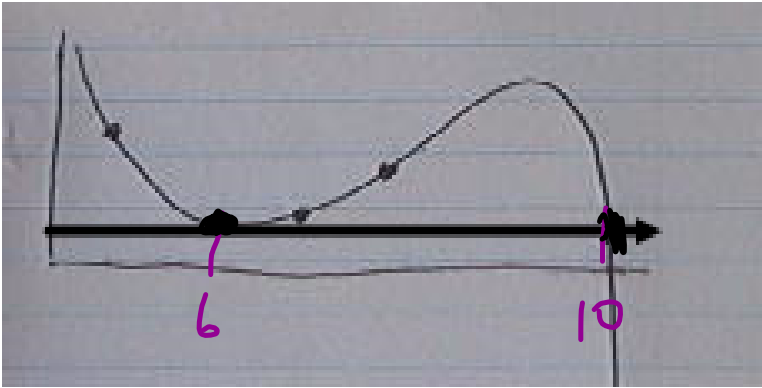
"jig"



$$y = x^5, x^7, x^9$$

jig = 3
 faces
 (5,7,9)

	d1	d2	d3	d4	d5	d6
name	line	para	cubic	quar	quin	sex
zeros	1	0,1, 2	1,2, 3,	0,1, 2,3, 4	1..5	0..6
faces	1 	2 	3 (jig) 	(jig +1) 4 	(jig +2) 5 	(2jig +3) 6 
max min (turnin g point)	0	1 	2,0 	3,1 	4,2 	5,3, 1 
end	disc	para	disc	para	disc	para



two zeros

6

10

touching
bouncing

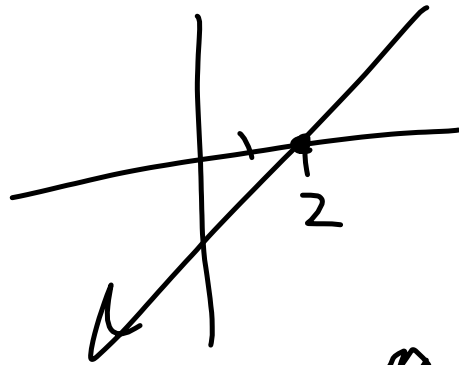
passing thru

EQUATION

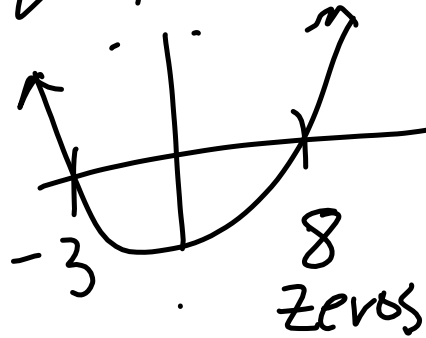
$$y = -\frac{1}{2}(x-6)(x-10)$$

disco "Left"

Pass
Thru

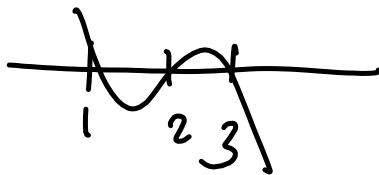


$$y = (x - 2)$$



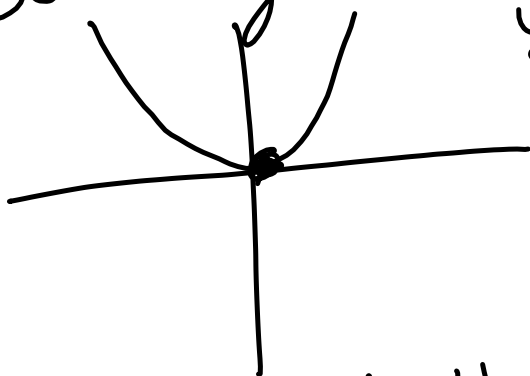
$$y = a(x - 8)(x + 3)$$

factor
of
Equation



$$y = -a(x - 1)(x - 2)(x - 3)$$
$$-ax^3 + \dots$$

Bouncing



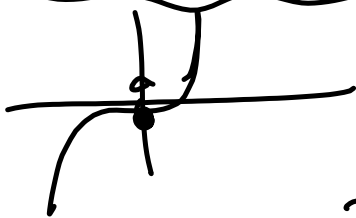
$$y = x^2 = x \cdot x$$

$$(x-0)(x-0)$$

Zeros: 0 0

Multiplicity (repeating): 2

zig

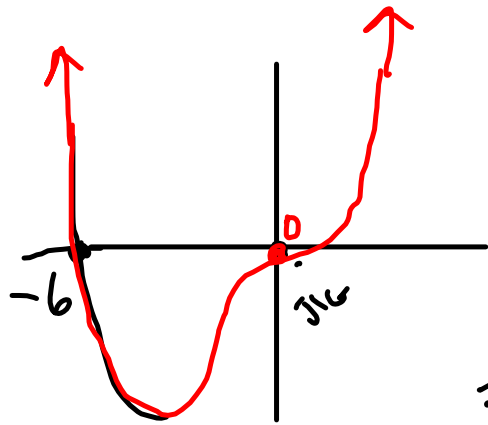


$$y = x^3$$

Zeros: 0, 0, 0

Multiplicity: 3

Factored Form
 $y = (x-a)(x-b)(x-c)$
Standard Form
 $y = x^4 + 6x^3 + 6x^2$



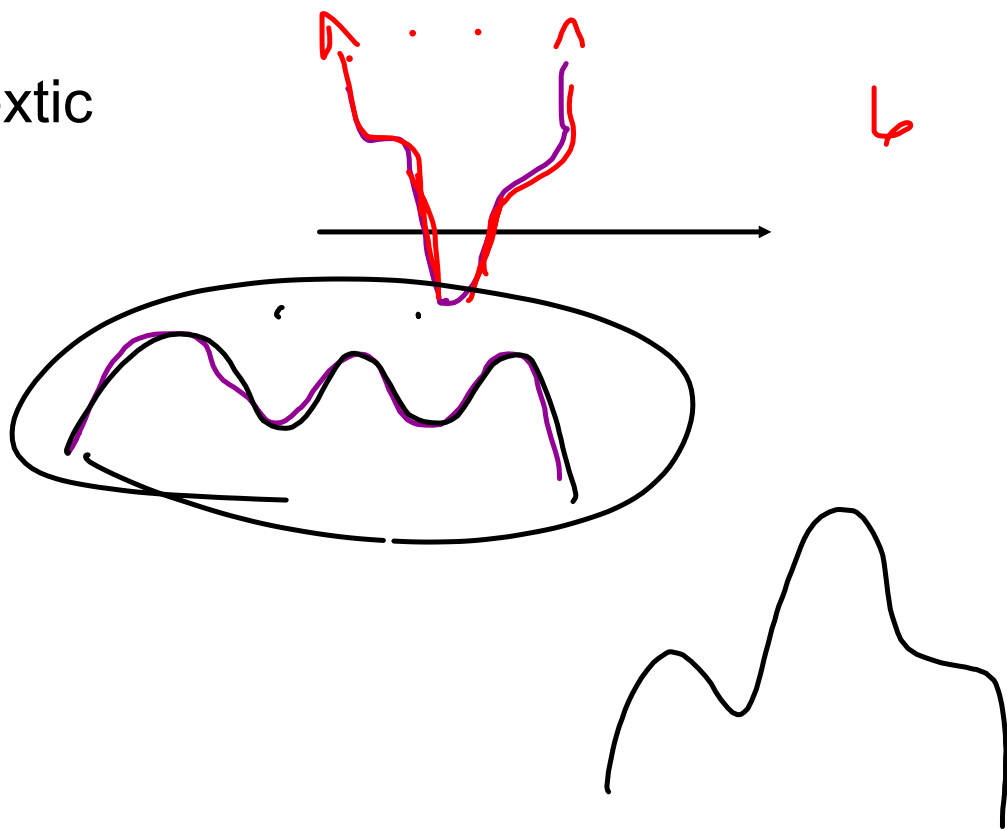
$$y = (x+6)x^3$$

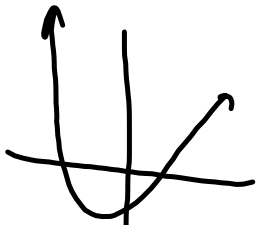
or

$$y = (x+6)x^3$$

Zeros:
-6, 0, 0, 0

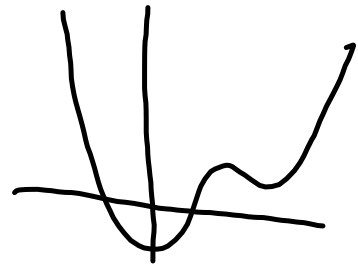
sextic





2 Faces
So

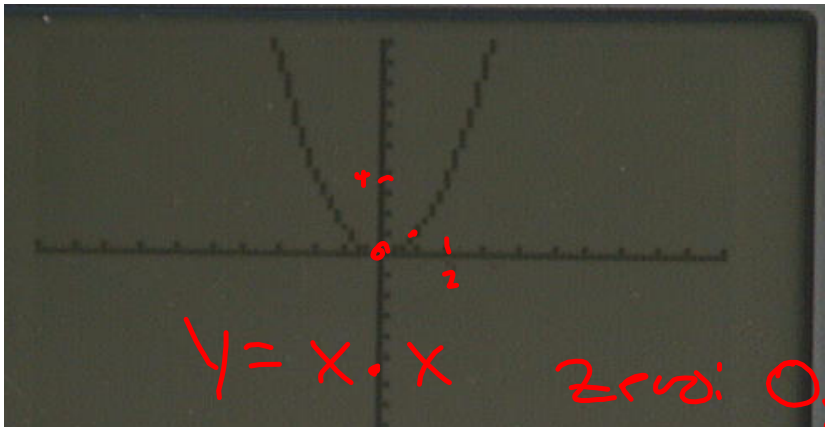
Degree $\boxed{2}$ or 4, 6, 8.



4 Faces

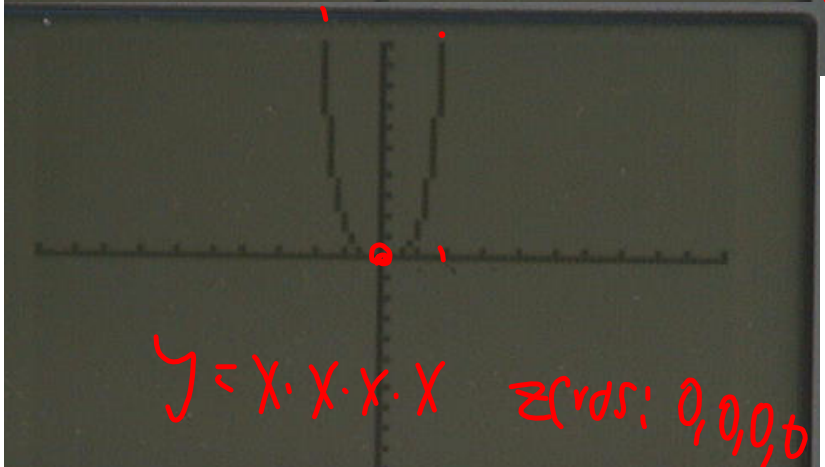
So
Degree $\boxed{4}$ or 6, 8, 10, ...

NOT $\underline{\underline{2}}$



$$y = x^2$$

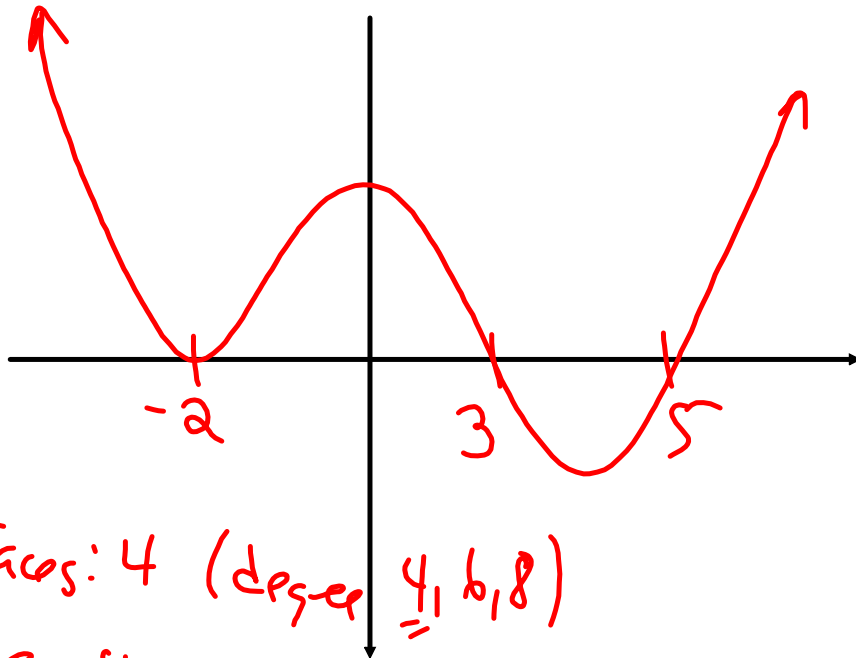
two faces one
zero touching



$$y = x^4$$

two faces

one zero
touching



Factors: 4 (degree 4, 6, 8)

Zeros: $-2, -2, 3, 5$
Touchy

$$y = (x+2)(x+2)(x-3)(x-5)$$

Zeros: $-2, 3$

Factor $(x+2)$ $(x-3)$

$$(x+2) = 0$$

Classwork

Evaluate and

Solve

with a Polynomial

regression

- Cubic or

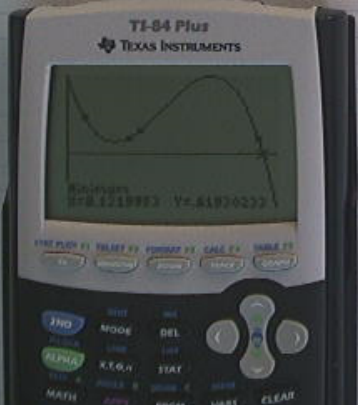
Quartic

Sold Out
Gen
John Palad
Andru

Number of Cusomers who bought discarded cigarettes

Cost	# of Cusomers bought
7.4	30
7.16	70
7.96	45
8.1	27

Marlboro Lights
 Marlboro Red
 Marlboro Mentol
 Marlboro Mentol Lights



zero
 $x = 8.122434$ $y = 0$
 pt. price of cigs cost
 \$8.1 we are not
 buying

At \$8.12 per
cigarette box
according to
cubic
regression
nobody will
buy

faces: 3

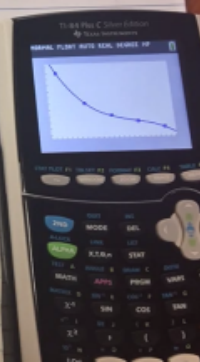
$\$$ | sold | Quad Regression cubic linear

\$80	3
\$75	4
\$70	5
\$65	7
\$60	12

$y = .0257...x^2 - 4.02x + 160.314..$

According to the Quad Regression we can expect that if the price drops to \$55 we are expected to sell 17 calculators

According to the cubic Regression we can expect that if we sell our calculators for \$85 then we will sell zero

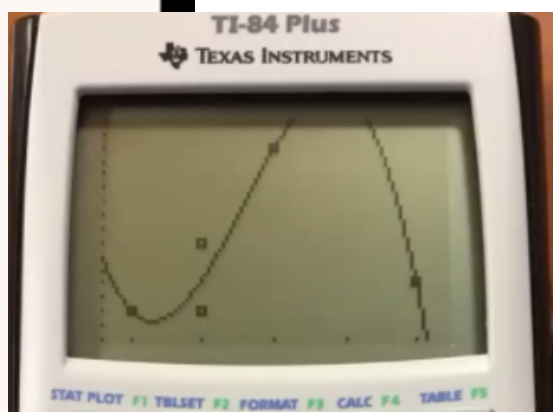


Data	
Purchased	Revenue
Suger 2	\$ 3.00
Nachos 2	\$ 7.96
Bacon 3	\$ 14.97
Nuggets 5	\$ 5.00
Frappe 1	\$ 2.99

Equation

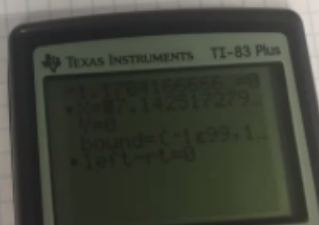
$$y = -1.944...x^2 + 12.809... - 9.792... \text{ (Quad Reg)}$$

$$y = -2.077...x^3 + 15.957x^2 - 30.827... + 19.9375 \text{ (Cubic)}$$

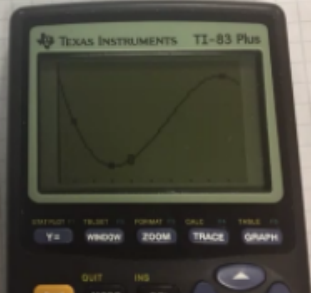


An item costing 5.16 will produce a revenue of zero dollars.

Cubic Reg
 $y = ax^3 + bx^2 + cx + d$
 $a = -1.17$
 $b = 245.66$
 $c = -17159.32$
 $d = 399065.30$
 $y = -1.17x^3 + 245.66x^2 - 17159.32x + 399065.30$
Zero: 77.01
At 77.01 a person should weigh nothing



Zero: 69.10



- height and weight
At 77" You should weigh nothing???

Notation

$$y_1(17) = 2.68$$

$y_1 =$ Linear Approx

$$f(17) = 2.68 \quad \text{Evaluate}$$

$$y_1(x) = 250$$
$$x = 18.39$$

Solver. Quartic
Rem

Solve.

Preview Quiz 2

5. Evaluating a piecewise-defined function

Suppose that the function g is defined, for all real numbers, as follows.

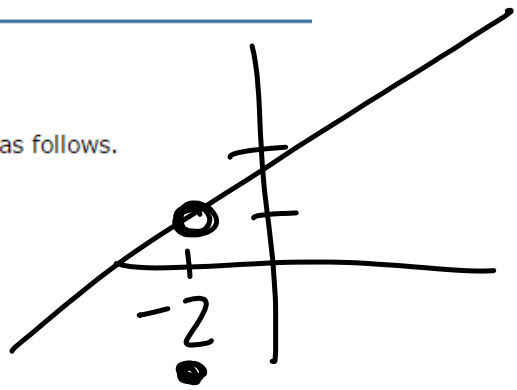
$$g(x) = \begin{cases} \frac{3}{4}x + 2 & \text{if } x \neq -2 \\ -2 & \text{if } x = -2 \end{cases}$$

Find $g(-4)$, $g(-2)$, and $g(5)$.

5. Evaluating a piecewise-defined function

Suppose that the function g is defined, for all real numbers, as follows.

$$g(x) = \begin{cases} \frac{3}{4}x + 2 & \text{if } x \neq -2 \\ -2 & \text{if } x = -2 \end{cases}$$



Find $g(-4)$, $g(-2)$, and $g(5)$.

You answered:

$$g(-4) = -1 = \frac{3}{4}(-4) + 2 = -1$$

$$g(-2) = -2$$

$$g(5) = 4.25$$

→ Your answer is incorrect.

- $g(-2)$: Your answer is incorrect.
- $g(5)$: Your answer is incorrect.

The correct answer is:

$$\frac{3}{4}(5) + 2 = 4.75$$

$$\frac{15}{4} + \frac{8}{4} = \frac{23}{4} = 5.75$$

Graphing a piecewise-defined function: Problem type 1

Use the graphing tool to graph the function g defined below, for all real numbers, as follows.

$$g(x) = \begin{cases} 1 & \text{if } x \leq -2 \\ x & \text{if } -2 < x \leq 2 \\ 1 & \text{if } x > 2 \end{cases}$$

Graph the function g .

The function g is defined piecewise. This means that it is defined according to different rules for different intervals of the domain.

test - 2nd Math

Graphing a piecewise-defined function: Problem type 1

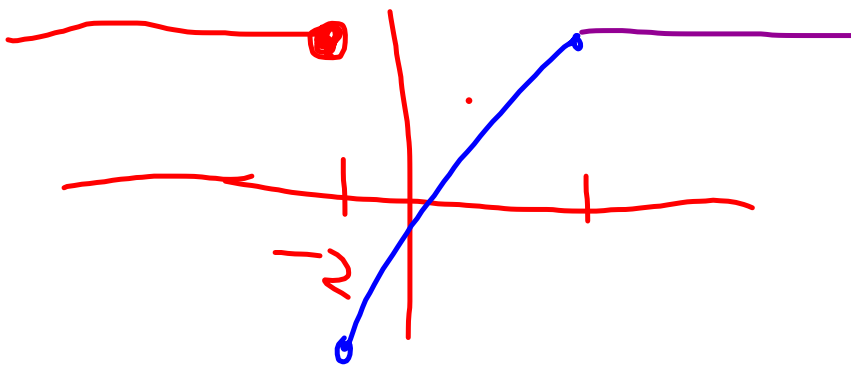
Suppose that the function g is defined, for all real numbers, as follows.

$$g(x) = \begin{cases} 1 & \text{if } x \leq -2 \\ x & \text{if } -2 < x \leq 2 \\ 1 & \text{if } x > 2 \end{cases}$$

$y_1 = 1 / (x \leq -2)$
 $y_2 = x / (-2 < x) / (x \leq 2)$
 $y_3 = 1 / (x > 2)$

Graph the function g .

Zoom 6: Zoom Standard



Vertical line test

For each graph below, state whether it represents a function.

Function?	<input type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Yes <input type="radio"/> No
Function?	<input type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Yes <input type="radio"/> No

Vertical line test

For each graph below, state whether it represents a function.

Function?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Function?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No