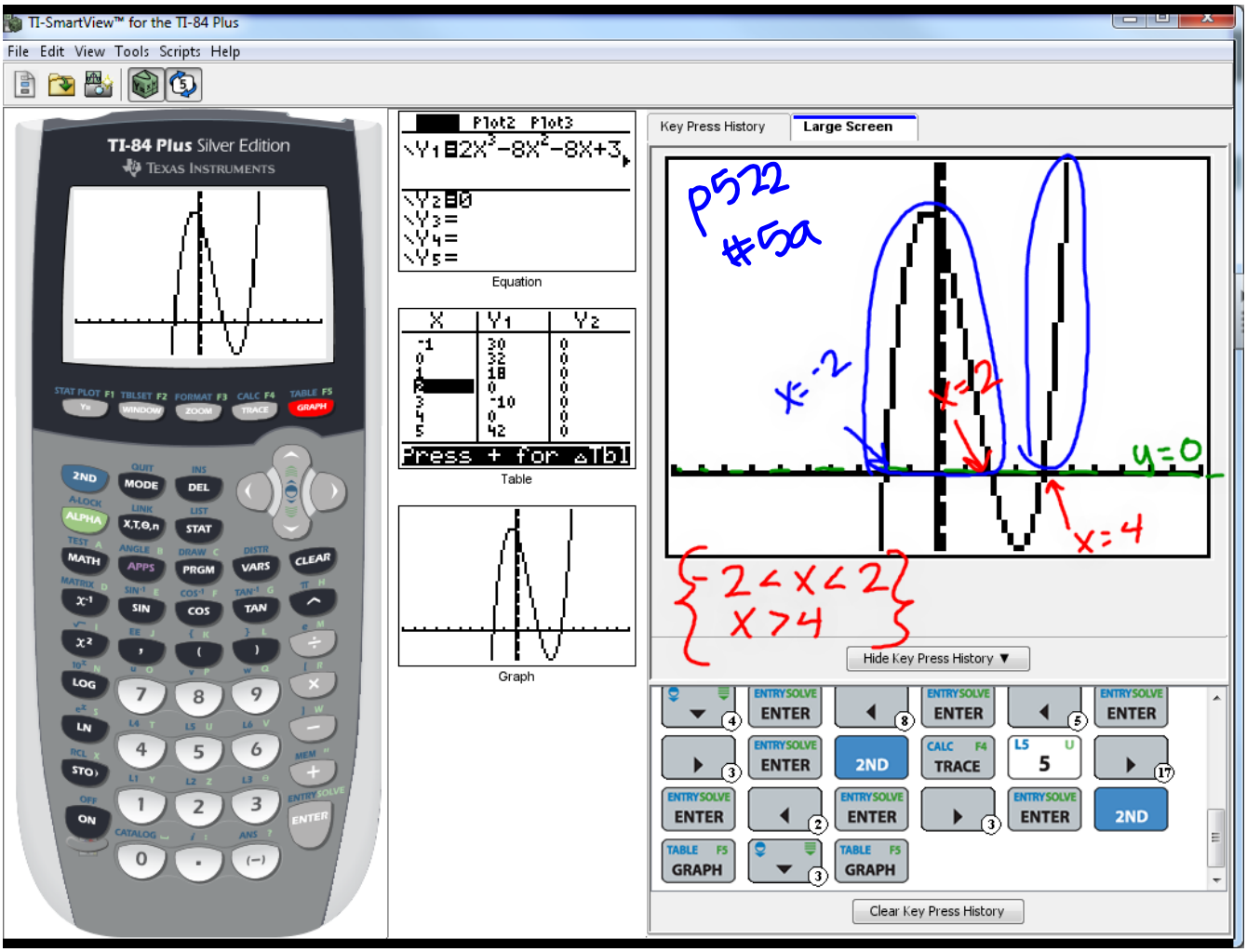
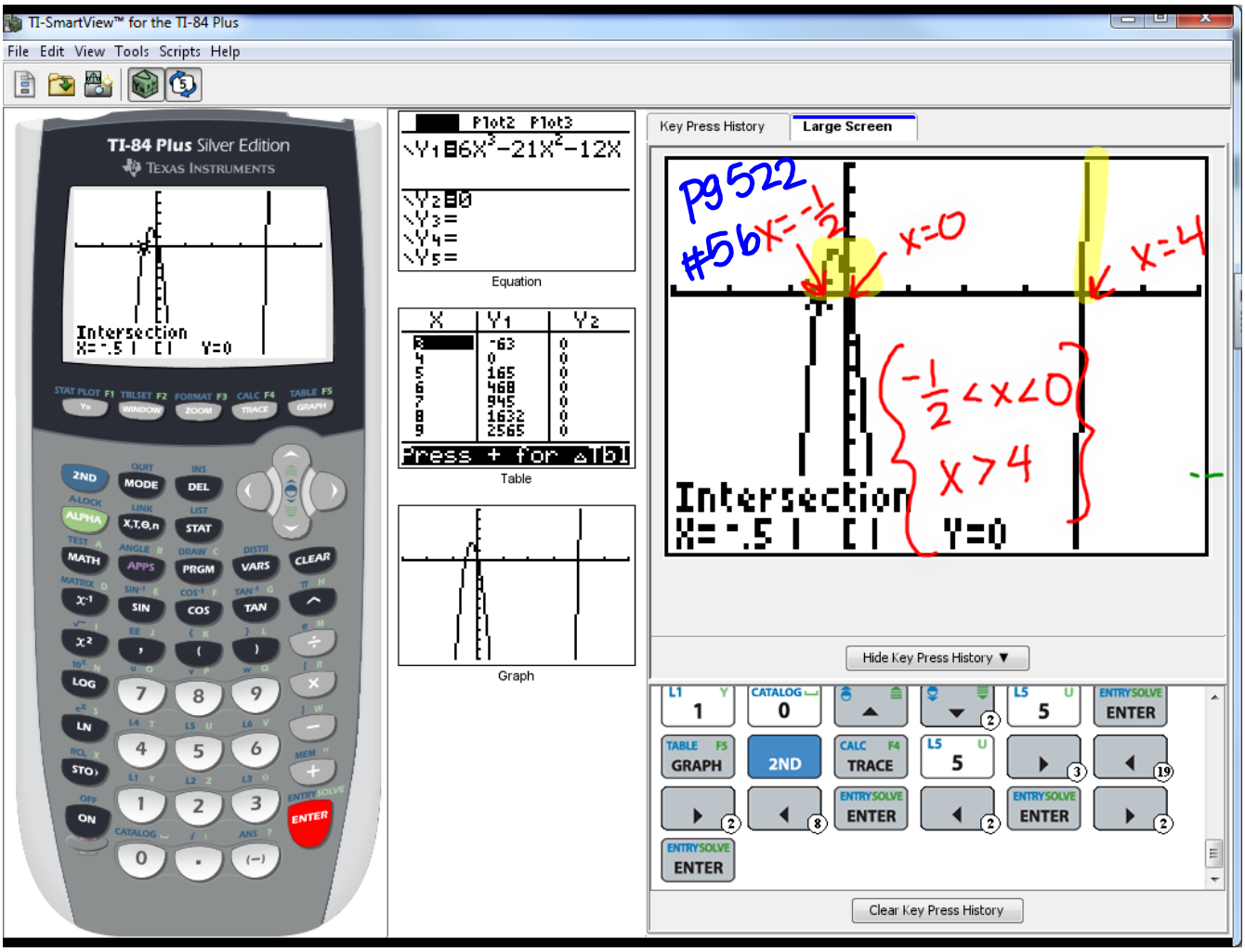
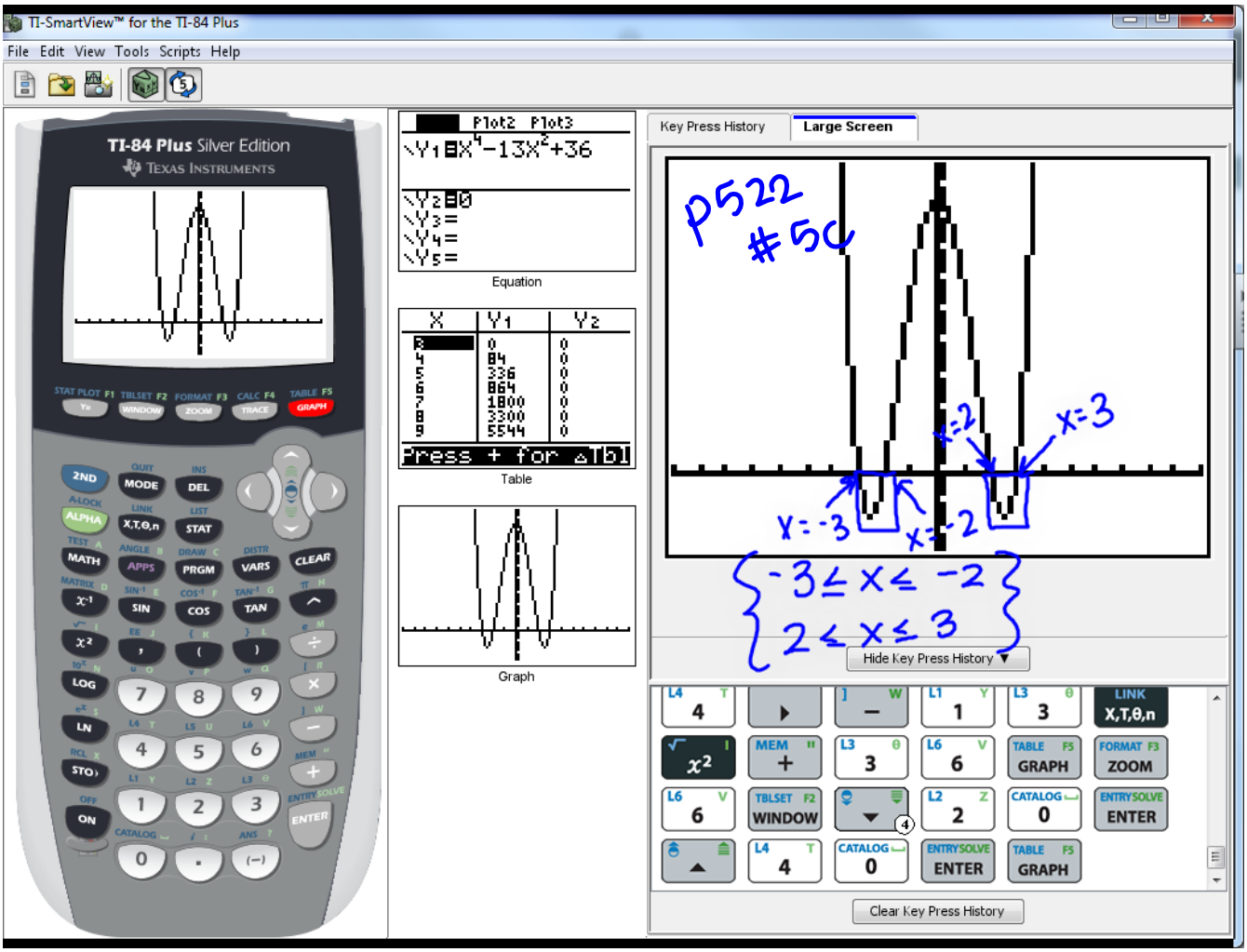
Questions on 7.1?

We'll be taking our content mastery quiz soon!

Dec 10-3:22 PM


TI-SmartView™ for the TI-84 Plus
File Edit View Tools Scripts Help
TI-84 Plus Silver Edition
Texas Instruments
Plot2 Plot3
Y1=2X^3-8X^2-8X+3
Y2=0
Y3=
Y4=
Y5=
Equation
X Y1 Y2
-1 30 0
0 32 0
1 18 0
2 0 0
3 -10 0
4 0 0
5 42 0
Press + for ΔTbl
Table
Graph
Key Press History
Large Screen
p522
#5a
x=-2
x=2
y=0
x=4
{-2<x<2
x>4}
Hide Key Press History
ENTER
2ND
TRACE
5
GRAPH
Clear Key Press History


TI-SmartView™ for the TI-84 Plus
File Edit View Tools Scripts Help
TI-84 Plus Silver Edition
Texas Instruments
Intersection
X=-.5 Y=0
Plot1 Plot2 Plot3
Y1=6X^3-21X^2-12X
Y2=0
Y3=
Y4=
Y5=
Equation
X Y1 Y2
-.5 -63 0
0 0 0
1 165 0
2 468 0
3 945 0
4 1632 0
5 2565 0
Press + for ΔTbl
Table
Graph
Key Press History
Large Screen
pg522
#56
x=-1/2
x=0
x=4
-1/2 < x < 0
x > 4
Intersection
X=-.5 Y=0
Hide Key Press History
Clear Key Press History

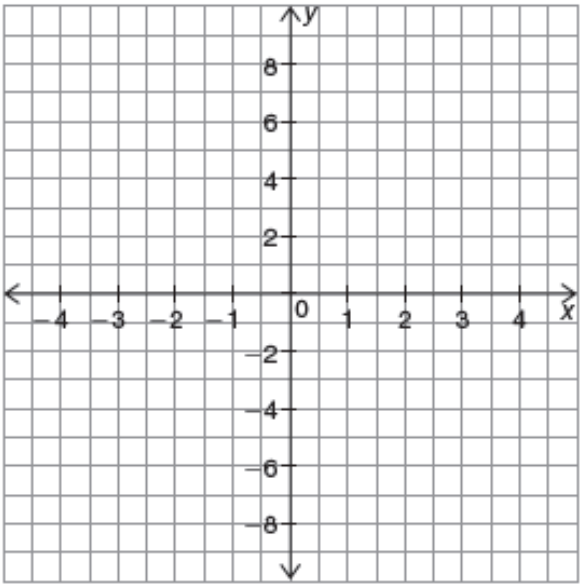

TI-SmartView™ for the TI-84 Plus
File Edit View Tools Scripts Help
TI-84 Plus Silver Edition
Texas Instruments
Plot2 Plot3
Y1=X^4-13X^2+36
Y2=0
Y3=
Y4=
Y5=
Equation
X Y1 Y2
Press + for ΔTbl
Table
Graph
Key Press History
Large Screen
p522 #5c
x=2
x=3
x=-3
x=-2
-3≤x≤-2
2≤x≤3
Hide Key Press History
Clear Key Press History

Jan 7-11:32 AM

Polynomial Inequalities Quiz

Write the solution to the following polynomial as an inequality or inequalities. Graph it if helpful.

$x^3 + 3x^2 + x + 3 \geq 0$



Dec 10-3:22 PM

7.1
7.5
Summary

Jan 7-11:49 AM

The Choice Is Yours
Comparing Polynomials in Different Representations

7.5

pg.553-554 in your book.

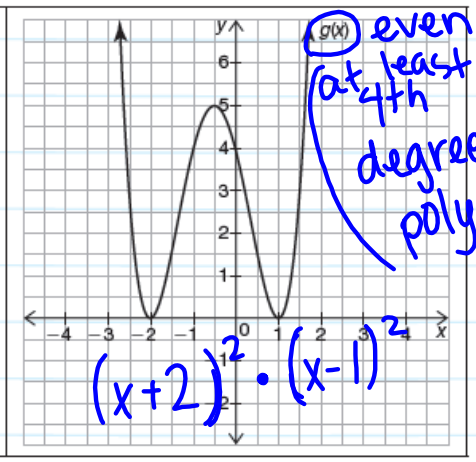
Recall that you can represent a polynomial using a graph, table of values, equation, or description of its key characteristics. The ability to compare functions using different representations is an important mathematical habit. This skill allows you to model problems in different ways, solve problems using a variety of methods, and more easily identify patterns. At times you may need to compare functions when they are in different representations.

When comparing two functions in different forms, it may be helpful to ask yourself a series of questions. Examples include:

- *What information is given?*
- *What is the degree of each function?*
- *What do I know about all functions of this degree?*
- *What key characteristics do I need to know?*
- *How do the functions compare?*

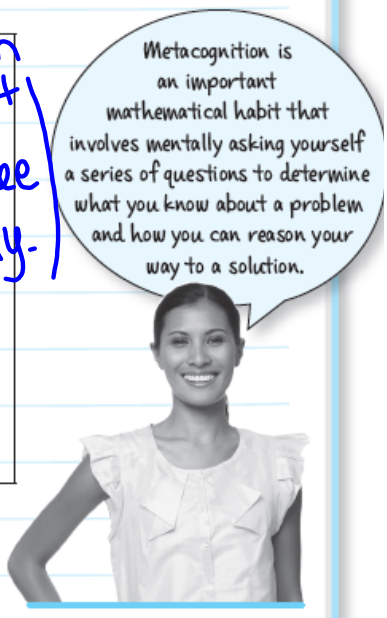
Consider two polynomial functions $f(x)$ and $g(x)$. Which polynomial has a greater number of real zeros? Justify your choice.

$f(x) = -2(x - 1)^3$



even (at least 4th degree poly.)

$(x+2)^2 \cdot (x-1)^2$



- The Fundamental Theorem of Algebra states that the number of zeros must be equal to the degree of the function. Therefore, $f(x)$ has 3 zeros.
- The function $f(x)$ has a real zero at 1 (multiplicity 3), so all zeros are real.
- The graph of $g(x)$ shows each zero has multiplicity 2, for a total of 4 real zeros.

The function $g(x)$ has 4 real zeros while $f(x)$ has 3. Therefore the correct choice is $g(x)$.

Nov 19-8:31 AM

pg.556 in your book

2. Analyze each pair of representations. Then, answer each question and justify your reasoning.

a. Which function has a greater degree?

A polynomial function $h(x)$ has 1 absolute maximum and 1 relative maximum.	$j(x) = -40(x - 7)^2 + 30x^2 - 17x + 1$

b. Which function has a greater degree?

x	$m(x)$
−2	9
−1	3
0	1
1	3
2	9

A polynomial function $n(x)$ has a real zero and an imaginary zero.

c. Which function has a degree divisible by 2?

x	$p(x)$
−2	2
−1	4
0	6
1	8
2	10

The function $q(x)$ has only imaginary solutions.

pg.557 in your book

d. Determine which function has the greater output as x approaches infinity.

An odd function $r(x)$ with $a < 0$.	$k(x) = x^6 + x^4 + 3x^2 + 5x - 10{,}000$

e. Determine which function has the greater output as x approaches negative infinity.

$t(x) = -3(x - 4)^8 + 130$	A quartic function $s(x)$ with y-intercept $(0, 5)$ and all imaginary roots.

Oct 9-8:12 AM

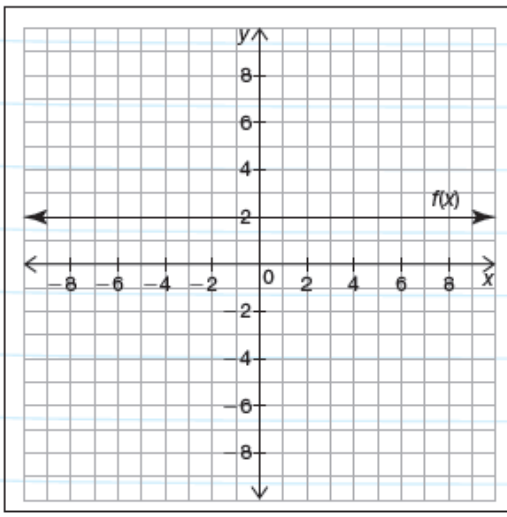
pg.558 in your book

Many problems in mathematics are unique, without specific step-by-step algorithms that lead to an answer. In Problem 1, *The Best of Both Representations*, you mentally asked yourself a series of metacognitive questions to compare functions in different representations. As you consider additional questions in this lesson, it may be helpful to compare the problems to ones that you have already completed.

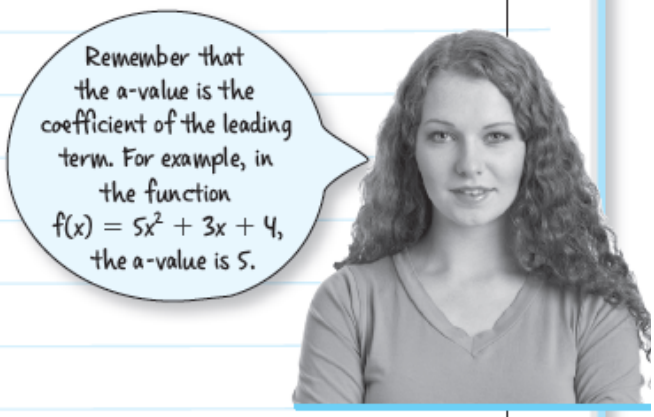
Ask yourself:

- *How is this problem the same or different than the previous ones that I have already solved?*
- *What do I know about the function that is given? What can I conclude that is not directly stated?*

Consider the representations shown. Which function has a greater *y*-intercept? Justify your reasoning.



A function $g(x)$ has an a-value less than zero and all roots have a multiplicity of 2.



Solution:

This problem is similar to previous problems in that you must consider functions with restrictions on the a-value and functions with multiple roots. The problem is also similar in that you must consider an output value for a given input. In this case, the input is 0.

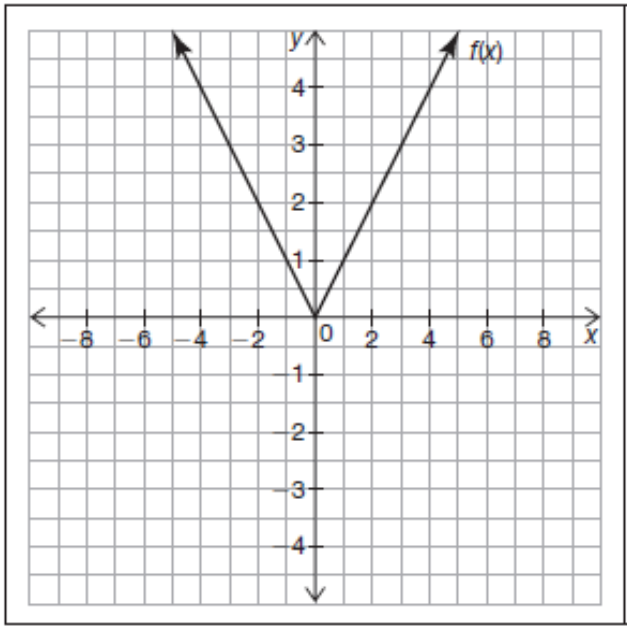
In function $f(x)$, the output value is 2 for any given input. Analyzing function $g(x)$, the multiplicity 2 tells you that the function is even, and the negative a-value indicates that the function opens downward. The multiplicity of the roots also tells you that the function does not cross the x-axis. Instead, it reflects at a given point where the double root occurs.

Comparing the two functions, you know that function $g(x)$ is always below the x-axis and function $f(x)$ is above the x-axis. Therefore, $f(x)$ has a greater y-intercept.

pg.560 in your book

2. Analyze each pair of representations. Then, answer each question and justify your reasoning.

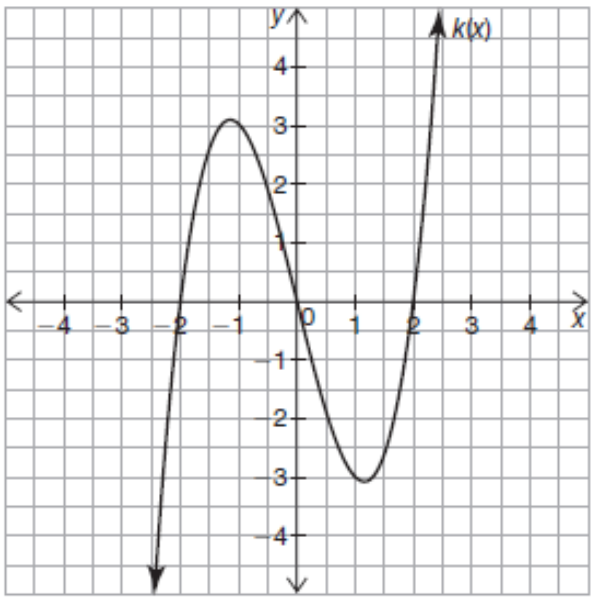
a. Which function has a greater average rate of change for the interval $(-4, 4)$?



$g(x) = x$

b. Which function has a greater average rate of change for the interval $(-1, 1)$?

x	$j(x)$
−2	4
−1	1
0	0
1	1
2	4



finish through pg.563

Oct 9-8:14 AM

Homework
Finish Lesson 7.5

Oct 21-8:47 AM