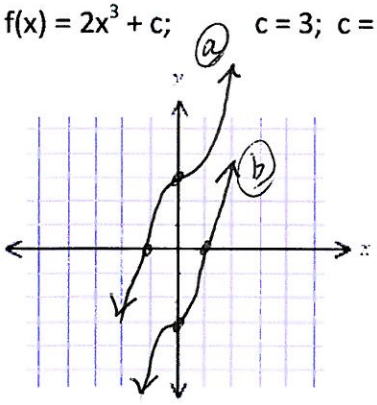
*AAT

Name: Key

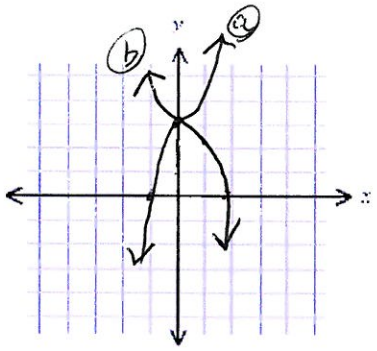
Chapter 4: 4-1 Polynomial Functions of Degree > 2 (IC/HW)-Day 1 Date: _____ Period: _____

Sketch the graph of f for the indicated value of c or a.

1. $f(x) = 2x^3 + c$; c = 3; c = -3

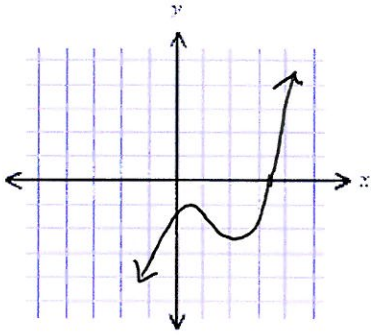


2. $f(x) = ax^3 + 3$; a = 2; a = -1/3

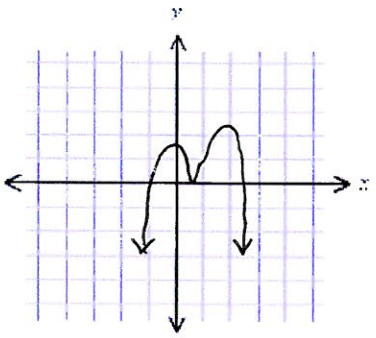


Graph and show that f has a zero between a and b.

3. $f(x) = x^3 - 4x^2 + 3x - 2$; a = 3, b = 4

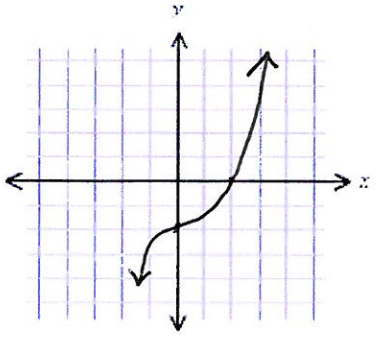


4. $f(x) = -x^4 + 3x^3 - 2x + 1$; a = 2, b = 3



Find all values of x such that f(x) > 0 and all x such that f(x) < 0, and then sketch the graph of f.

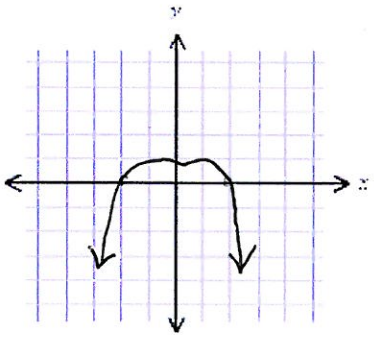
5. $f(x) = \frac{1}{4}x^3 - 2$



f(x) > 0 if x > 2

f(x) < 0 if x < 2

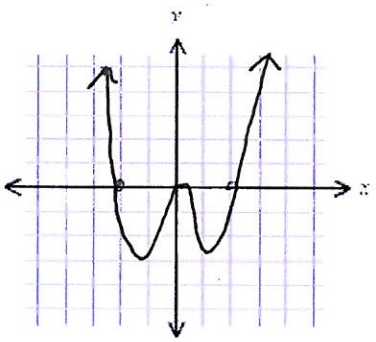
6. $f(x) = -\frac{1}{16}x^4 + 1$



f(x) > 0 if -2 < x < 2

f(x) < 0 if x > 2 or x < -2

7. $f(x) = x^4 - 4x^2$

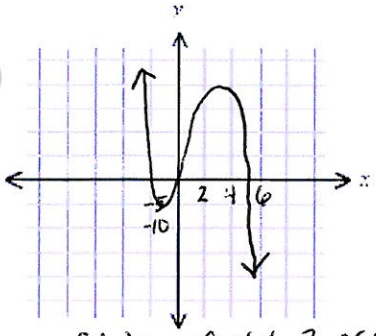


f(x) > 0 if x > 2 or x < -2

f(x) < 0 if 0 < x < 2

or 0 > x > -2

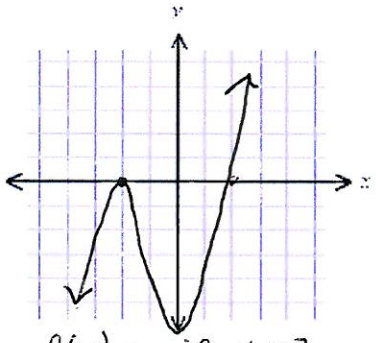
8. $f(x) = -x^3 + 3x^2 + 10x$



$f(x) > 0$ if $x < -2$ or $0 < x < 5$

$f(x) < 0$ if $-2 < x < 0$ or $x > 5$

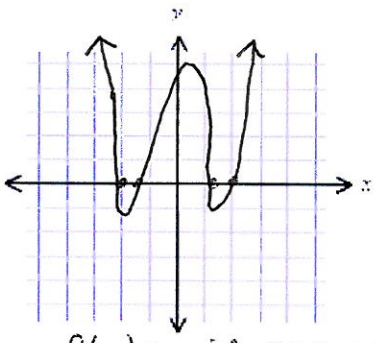
9. $f(x) = x^3 + 2x^2 - 4x - 8$



$f(x) > 0$ if $x > 2$

$f(x) < 0$ if $x < -2$ or $-2 < x < 2$

10. $f(x) = x^4 - 6x^2 + 8$



$f(x) > 0$ if $x > 2$ or $x < -2$ or $-1.4 < x < 1.4$

$f(x) < 0$ if $1.4 < x < 2$ or $-2 < x < -1.4$

11. If $f(x) = 3x^3 - kx^2 + x - 5k$, find a number k such that the graph of f contains the point (-1, 4).

$f(-1) = 3(-1)^3 - k(-1)^2 + (-1) - 5k$

$= -3 - k - 1 - 5k$

$= -4 - 6k$

$4 = -4 - 6k$

$8 = -6k$

$k = \frac{-4}{3}$

12. If one zero of $f(x) = x^3 - 2x^2 - 16x + 16k$ is 2, find two other zeros.

$f(2) = 0$

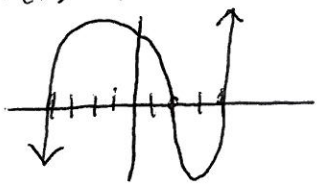
$0 = 2^3 - 2(2)^2 - 16(2) + 16k$

$0 = -32 + 16k$

$32 = 16k$

$k = 2$

$f(x) = x^3 - 2x^2 - 16x + 32$



2, ± 4

13. From a rectangular piece of cardboard having dimensions 20 inches x 30 inches, an open box is to be made by cutting out identical squares of area x^2 from each corner and turning up the sides.

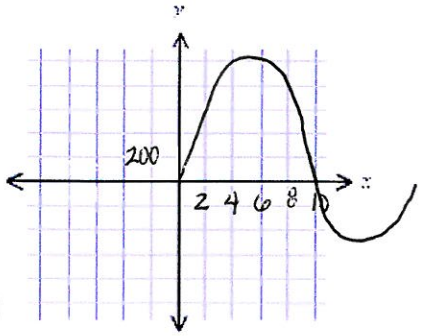
(a) Find a function for the volume V(x) of the box.

$V(x) = l \cdot w \cdot h$

$= (30 - x - x)(20 - x - x)x$

$= (30 - 2x)(20 - 2x)(x)$ or $4x(10 - x)(15 - x)$

(b) Find all positive values of x such that $V(x) > 0$, and sketch the graph of V for $x > 0$.



$V(x) > 0$ on $(0, 10)$ & $(15, \infty)$

Allowable values for x are in $(0, 10)$