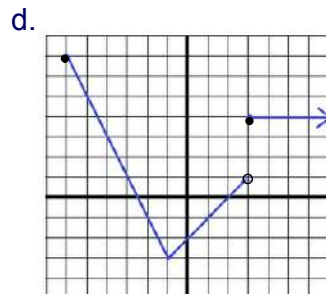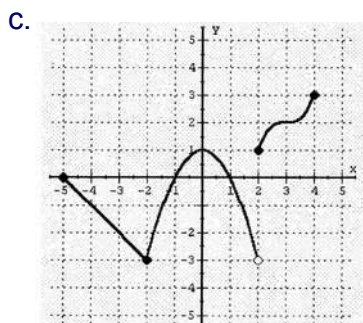1. Determine the domain of the following functions:

    a. $f(x) = \sqrt{x + 7}$

    b. $f(x) = \dfrac{6}{x - 2}$

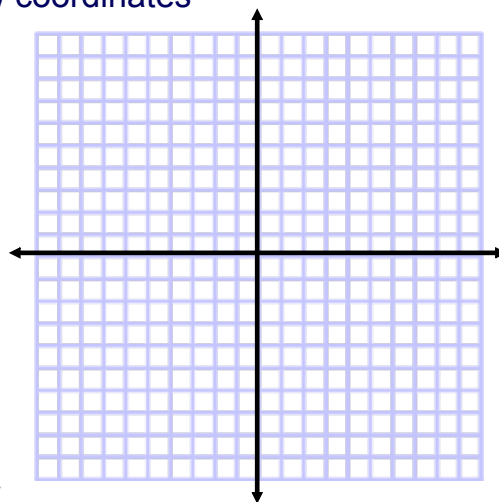   c.

    d.

2. Find all vertical and horizontal asymptotes of the graph of...

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

    $$f(x) = \frac{3x + 1}{3x^2 + x}$$

3. a. Graph the piecewise function...show coordinates

    $$f(x) = \begin{cases} 3x - 2 & x > 0 \\ 2x^2 - 1 & x \le 0 \end{cases}$$

    b. Is the function discontinuous?
        If so, state the point of discontinuity
        and what type of discontinuity is occurring.

4. Solve the equation algebraically: $2x^2 - 7x - 4 = 0$

5. Solve the equation algebraically: $\sqrt{x+3} = x-3$

6. Let $f(x) = 4x - 7$ and $g(x) = \sqrt{x+1}$ and $h(x) = \dfrac{4}{x}$
   a. find $g \circ f(x)$ and state the domain

   b. find $h \circ g(x)$ and state the domain

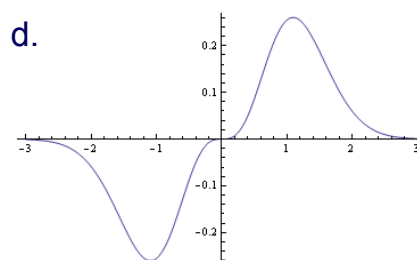   c. find $(f + g)(x)$ and state the domain

   d. find $(h + g)(x)$ and state the domain

7. Determine whether the function is even, odd or neither

   a. $g(x) = 3x^4 - 2x^2 - 5x^0$

   even exponents....even function

   c. $k(x) = \dfrac{5}{x^2 + 2}$

   even exponents....even function

   b. $j(x) = 2x^3 + 5x - 7x^0$

   mixture of even and odd exponents...
   ...neither!

   d.

   rotates around the origin...odd function

8. Describe how the graph of $y = -3\left|\frac{1}{4}(x+1)\right| + 7$ can be obtained from the graph of $y = |x|$

9. From the list of 12 basic functions...

a. list 3 that are odd functions.

    cubic, reciprocal, linear, sine

b. list 3 that have asymptotes.

    reciprocal, logistic, natural log, exponential

c. list 5 that have domain of all reals.
    cubic, absolute value, linear, sine, squaring, cosine, logistic, exponential, greatest integer

12. Use a graphing calculator to sketch the graph $f(x) = x^3 - x^2 - 2x + 4$

a. Find the zeros of the function
                -1.66

b. Find all local maxima and minima
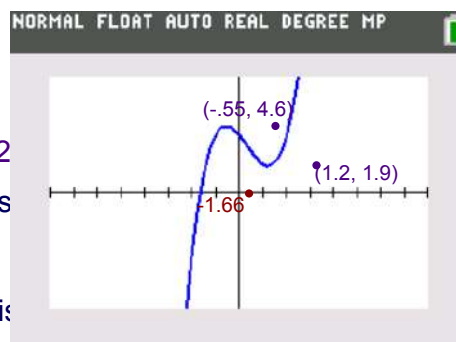   l.max: 4.6 at x = -.55   l.min: 1.9 at x = 1.2

c. Identify intervals where the function is increasing $(-\infty, -.55) (1.2, \infty)$

d. Identify intervals where the function is decreasing $(-.55, 1.2)$

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(-.55, 4.6)

(1.2, 1.9)

-1.66

13. Let f(x) = $\overline{x+5}$

    a. Explain why f has an inverse that is also a function.

         Sketch the graph & passes HLT

    b. Find f⁻¹ and state its domain.

$$x = \sqrt[3]{y+5}$$
$$x^3 = y+5$$

$$y = x^3 - 5$$
$$(-\infty, \infty)$$

Consumer Price Index (Hou	
Year	Housing CP
1990	128.5
1995	148.5
2000	169.6
2002	180.3
2003	184.8
2004	189.5
2005	195.7
2006	203.2
2007	209.6

14. Using your calculator, determine a <u>linear</u> and <u>quadratic</u> regression for the data from the table.

Stat Edit

NORMAL FLOAT AUTO REAL DEGREE MP					
L1	L2	L3	L4	L5	2
90	128.5	------	------	------	
95	148.5				
100	169.6				
102	180.3				
103	184.8				
104	189.5				
105	195.7				
106	203.2				
107	209.6				

L2(10)=

stat calc linear

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LinReg
y=ax+b
a=4.694086022
b=-296.811828
r²=.9908252203
r=.9954020395

$$y = 4.7x - 296.8$$

stat calc Quad

NORMAL FLOAT AUTO REAL DEGREE MP

QuadReg
y=ax²+bx+c
a=.0884994958
b=-12.75815729
c=560.4913521
R²=.9987976564

$$y = .09x^2 - 12.8x - 560.5$$

Which one is better suited to the data?

Quadratic