Math 12 Foundations

Chapter 6 Polynomial Functions

Lesson #1 Exploring the Graphs of Polynomial Functions

Date: _____

Define:

1. Scatter plot _____

_____

2. Polynomial Function _____

_____

3. End Behavior _____

_____

4. Cubic Functions _____

_____

5. Turning Point _____

_____

6. Domain _____

_____

7. Range _____

_____

8. X intercept _____
9. Y intercept _____

Polynomial functions are named according to their _____.

Polynomial functions of degrees:

- 0 are called _____
- 1 are called _____
- 2 are called _____
- 3 are called _____

Example of Polynomial Functions:

- Constant function: _____
- Linear function : _____
- Quadratic function: _____
- Cubic function: _____

Graph the following Polynomial function:

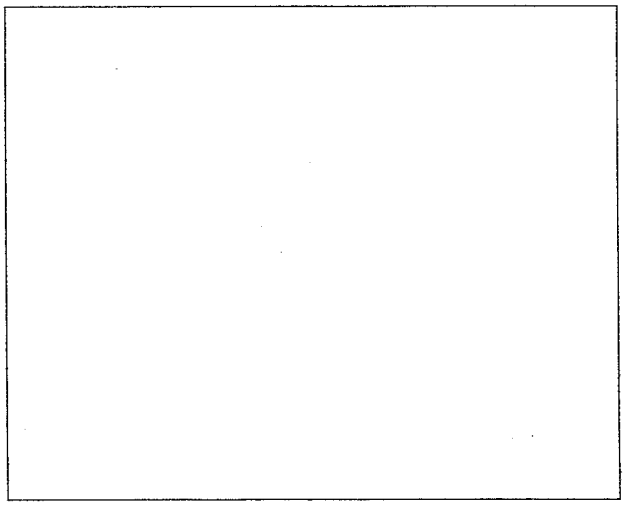
Example #1: $f(x) = x + 1$ Degree _____

Number of x-intercepts: _____ Number of y intercepts: _____

Domain: _____ Range: _____

End Behavior: _____

Sketch:



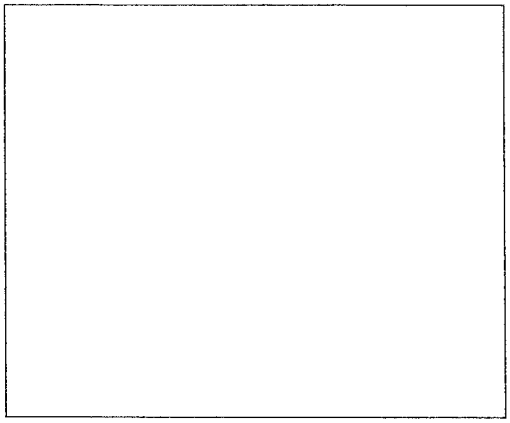
Example 2: $f(x) = -2x - 1$ Degree _____

Number of x intercepts _____ Number of y intercepts _____

Domain _____ Range _____

End Behavior _____

Sketch:



The degree of the polynomial functions determines the _____ of the graph

Fill in the table: (consult p 382)

Type of Function	Constant	Linear	Quadratic	Cubic
Degree				
Sketch				
Number of x-intercepts				
Number of y-intercepts				
End Behavior				
Domain				
Range				
Turning Points				

Assignment: p 383 #1a-f, #3 a-f

Math 12 Foundations

Unit 6 Polynomial Functions

Lesson 6.2 Characteristics of the Equations of Polynomial Functions

Date: _____

Objective: Understand the relationship between the coefficients and constant in the equation of the function and the characteristics of the graph.

Define:

1. Standard Form:
   Linear Function _____
   Quadratic Function _____
   Cubic Function _____
2. Leading Coefficient _____

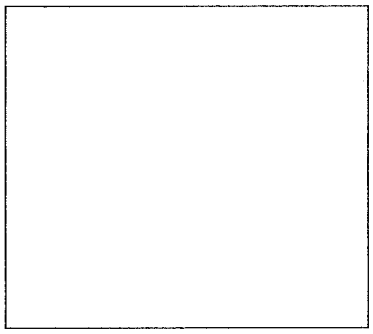
_____

3. Coefficient _____
4. Constant _____

Graph the following polynomial functions and sketch on the following page:

a) $f(x) = \frac{1}{2}x - 6$
b) $f(x) = -5x - 2$
c) $f(x) = -2x^2 + 2x + 4$
d) $f(x) = x^2 - 6x + 12$
e) $f(x) = -2x^3 + 4x^2 - 3x + 1$
f) $f(x) = 2x^3 + 4x^2 - 3x + 1$
g) $f(x) = x^3 - 2x^2 - 15x + 36$
h) $f(x) = x^3 - 8$
i) $f(x) = -x^3 + 2x^2 + 15x - 10$

a) _____



[ ]

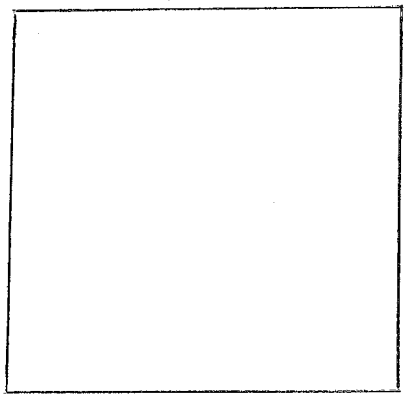
[ ]

_____

_____

_____

b) _____



[ ]

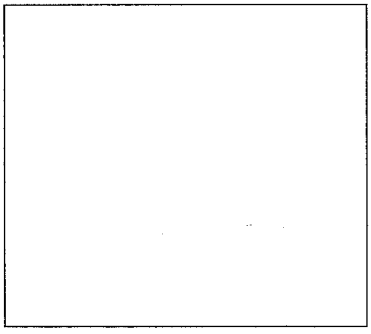
[ ]

_____

_____

_____

c _____



[ ]

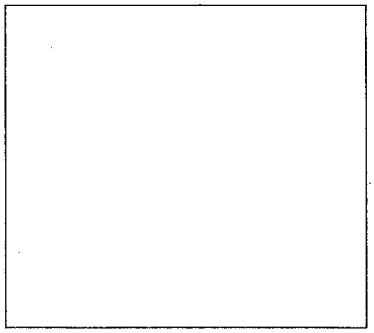
[ ]

_____

_____

_____

d _____



[ ]

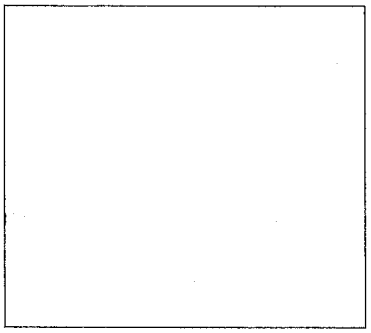
[ ]

_____

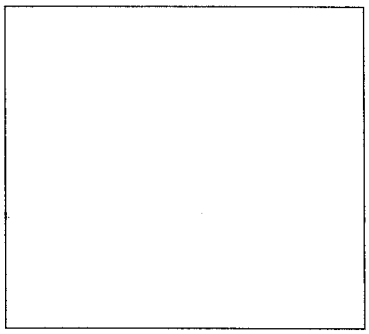
_____

_____

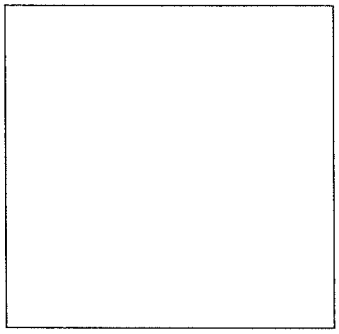
e _____



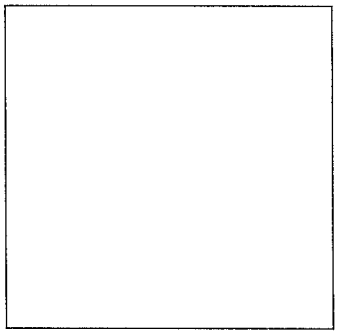
f _____



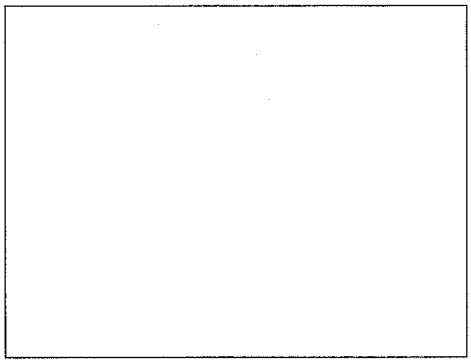
g _____



h _____



i _____



[ ]

[ ]

_____

_____

_____

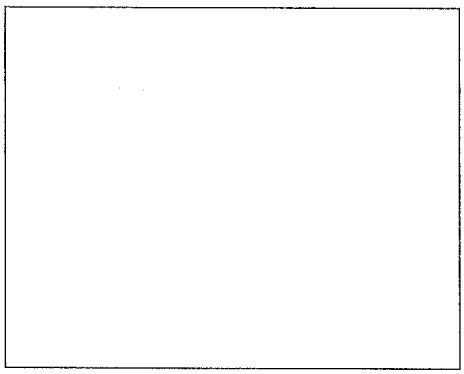
Example #2: Polynomial Functions, x and y intercepts, end behavior, turning points, domain and range.

Graph the following polynomial functions and note the above for each graph:

a) $f(x) = 3x - 5$

[ ]

[ ]



x intercept(s) _____

y intercept (s) _____

end behavior _____

turning points _____

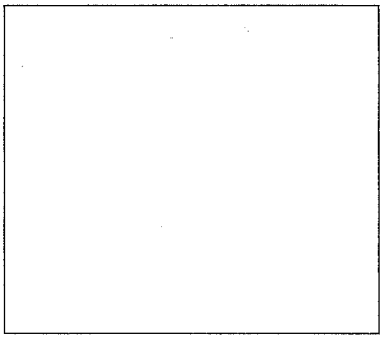
domain _____

range _____

b) $f(x) = -2x^2 - 4x + 8$

[ ]

[ ]



x intercept(s) _____

y intercept(s) _____

end behavior _____

domain _____

range _____

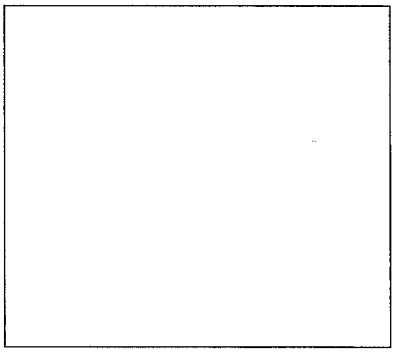
c) $f(x) = 2x^3 + 10x^2 - 2x - 10$

x intercept(s)_____

y intercept(s) _____

end behavior _____

turning points _____



[ ]

[ ]

domain _____ range _____

Assignment p393 #1ac,2aci-iii, 3b,d,5d,f,6i,ii, 7bc

Math 12 Foundations

Chapter 2 Polynomial Functions

Lesson #3 Modelling Data with a Line of Best Fit

Date: _____

Define:

1. Line of best fit _____

_____

2. Interpolation _____

_____

3. Extrapolation _____

_____

4. Discrete Data _____

_____

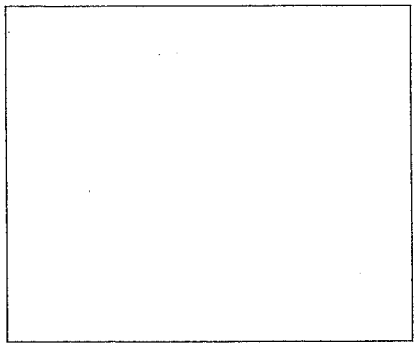
5. Continuous Data _____

_____

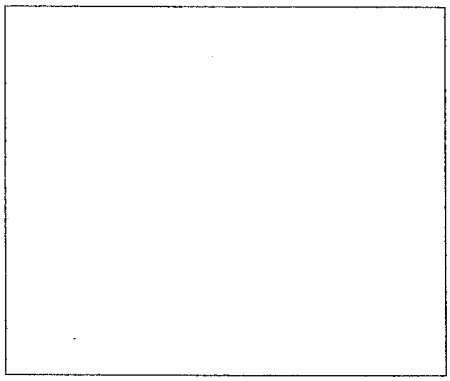
Step 2: Entering the data in the table into the graphing calculator:

Press: 2^{nd} y=	Turn Stat Plot 1 on. Select scatter plot under type.
Press y=	Clear all equations
Press stat enter	Clear all data in L1 and L2
Enter height data into L1	
Enter height data into L2	
Press Window	Adjust windows (see table for min and max values)
Press graph	

Sketch the window. Include: title, x and y labels, window settings



Sketch the graph. Include title, label x and y axis, and window settings.



Equation: y = _____

Using the above equation *interpolate* a possible world-record distance for the year 2006:

Assignment: p 407 # 3a-d, #6a-d, 10, 11a-c (Include work,equations,graphs)

Math 12 Foundations

Unit 6 Polynomial Functions

Lesson #4 Modelling Data with a Curve of Best Fit

Date: _____

Define:

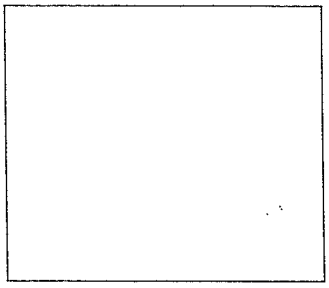
Curve of best fit _____

_____

Problem #1 – Speed vs Stopping Distance

Graph the data for speed of a vehicle and the stopping distance on p414 on your text.

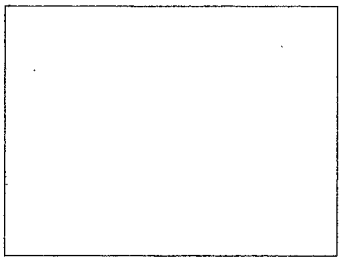
Sketch the graph:



1. What is the shape of the points? _____
2. Would you use linear regression _____

Because the line is curved use _____ regression to create a line of best fit and determine the equation.

Sketch the line of best fit:



Equation _____

Compare the stopping distances for 30km and 50 km.

Is the stopping distance for 50km greater than 30 km? _____

Approximately how many times _____

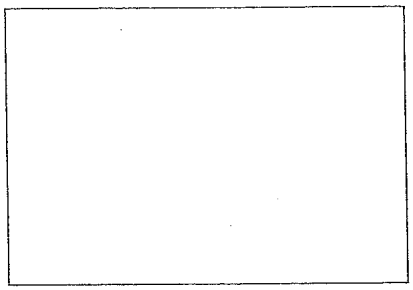
Determine the maximum speed that a car should be travelling in order to stop within 4m, the average length of a car. (trace on calculator. Verify with 2nd trace, value) _____

Problem #2:

Graphing a curved scatterplot: Year vs. retail price of gasoline.

Enter the data from the table on p416 of your text.

Sketch the scatterplot:

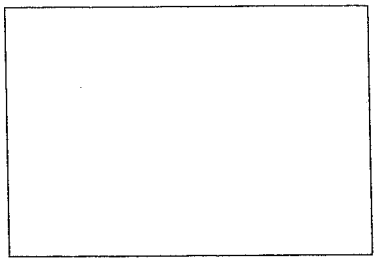


How many turning points does the graph appear to have _____

To draw a line of best fit and determine the equation, use the _____

regression.

Sketch the line of best fit:



Equation _____

Determine what year the average price of gas was $ 0.56 / L.

Substitute 56 into the above equation for y and solve for x; or use the trace, 2nd trace value function on your calculator.

In _____ the gas was $ 0.56 / L

Assignment: P420 #3a-d, 9a,b (include graphs, equations, work)