Name:_____

Section 1: Multiple Choice.

1. What is the leading coefficient of the polynomial: $y = -2x^2 + 5x - 3$?   1. _____

   A) –3   B) -2   C) 5   D) x

2. What is the end behaviour of the graph of: $y = -3x^3 + 4x + 5$?   2. _____

   A) Q2 to Q1   B) Q3 to Q1   C) Q2 to Q4   D) Q3 to Q4

3. What is the maximum number of turning points a cubic polynomial have?   3. _____
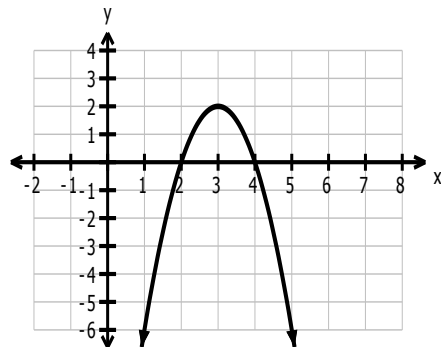
   A) 0   B) 1   C) 2   D) 3

4. What is the domain of $y = 3x - 1$?   4. _____

   A) $\{x \mid x \geq -1, x \in R\}$ B) $\{x \mid x \in R\}$ C) $\{y \mid y \geq -1, y \in R\}$ D) $\{y \mid y \in R\}$
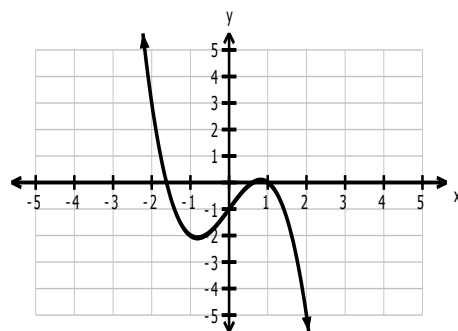
5. What is the range of the function graphed below?   5. ___

   A) $\{x \mid x \geq 3, x \in R\}$

   B) $\{x \mid x \leq 3, x \in R\}$

   C) $\{y \mid y \geq 2, y \in R\}$

   D) $\{y \mid y \leq 2, y \in R\}$

6. What is the equation of the following graph?   6. _____

   A) $y = x^3 + 2x - 1$

   B) $y = -x^3 + 2x - 1$

   C) $y = x^3 + 2x + 1$

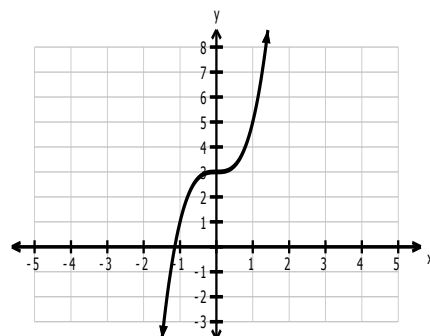   D) $y = x^3 + 2x + 1$

7. What is the y-intercept of $y = 2x^2 + 3x - 5$?   7. _____

   A) –5   B) 2   C) 3   D) none

8. What is the constant term for the following graph?   8. _____

   A)   –1

   B)   0

   C)   1

   D)   3

9. From which quadrants does the graph of $y = -4x^2 - 7$ extend?   9. _____

   A) Q2 to Q1   B) Q3 to Q4   C) Q3 to Q1   D) Q2 to Q4

10. What is the degree of $y = 2x^3 - 4x^2 + 7x - 3$?   10. ____

    A) 0   B) 1   C) 2   D) 3

11. What is the maximum number of x-intercepts for $y = 3x - 5$?   11. ____

    A) 0   B) 1   C) 2   D) 3

12. Which function passes through the point $(2, -10)$?   12. ____

    A) $f(x) = -x^3 + x - 4$ B) $f(x) = -x^3 + x - 10$

    C) $f(x) = x^3 + x - 4$ D) $f(x) = x^3 + x - 10$

13. Given the scatter plot and the curve of best fit of the polynomial f(x),   13. ____

    what is the value of f(30)?
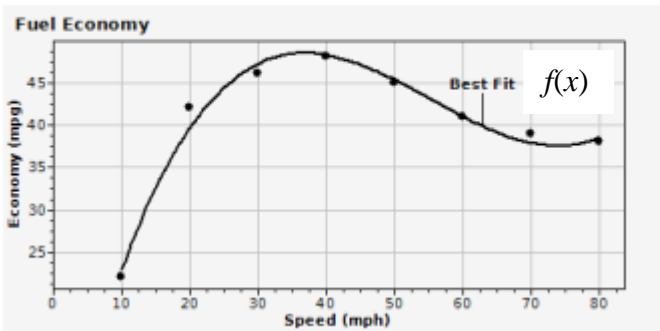
A) 13

B) 32

C) 47

D) 58

Section 2: Constructed Response.

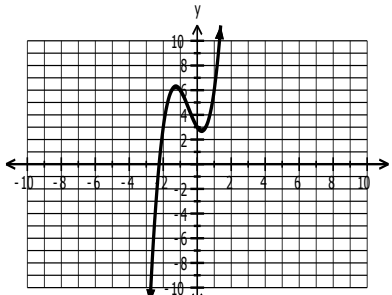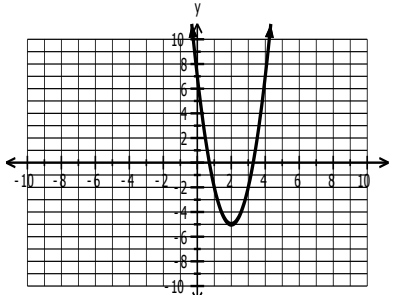1. Determine the following characteristics of each function:

Characteristics	$f(x) = 3x^3 - 4x^2 + 2x - 1$	$f(x) = -2(x - 3)^2 + 3$
Number of possible x-intercepts		
y-intercept		
Domain		
Range		
Number of possible turning points		
End behaviour		

2. Sketch a possible graph of polynomial functions that satisfy each set of characteristics:

    A) Quadratic, one x-intercept, negative   B) Two turning points (one in Q2 and Q4), positive
       Leading coefficient   leading coefficient and constant term of -4

C) Degree 2, one turning point which is a maximum, constant term of 3

D) Degree 1, positive leading coefficient and *y*-intercept of -2

3.   Determine the following characteristics for the following polynomials:

Characteristics		
Degree		
Sign of Leading Coefficient		
Constant term of function		
End behaviour		
y-intercept		
Domain		
Range		

4.   Write an equation for a polynomial function that satisfies each set of characteristics:

A) Degree 1, decreasing function, *y*-intercept of -2	B) One turning point, max value, *y*-intercept of 3
C) Cubic extending from Q2 to Q4, y-intercept of 0	D) Extending from Q2 to Q1, *y*-intercept of 5, no *x*-intercept or turning point

5.   Sketch two possible graphs that are different, yet both are cubic functions with positive leading coefficients and negative y-intercepts. Explain why the graphs you sketched are different.

6.   The table below shows the birthrate in Canada per 1000 people.

Number of years after 1975	0	5	10	15	16	17	18	19
Birthrate (per 1000 people)	15.3	15.5	14.9	14.3	14.1	13.6	13.3	12.9

When a linear regression is performed on this data, the equation $y = -0.13x + 15.81$ is obtained.

a) What is does the -0.13 represent in this equation?

b) Assuming this trend continues, what will the birthrate in Canada be in 2020?

c) In what year will the birthrate be 11.2?

7. Two hoses together can fill a pool in 2 hours. If only hose A is used, the pool fills in 3 hours. How long would it take to fill the pool if only hose B is used?