**Math 3201 Unit 5 Exam**

**Name:**

**Circle the letter of the best response. (26%)**

1. What is the range of the function  shown in the graph below?

(A) 

(B) 

(C) 

(D) 

1. What is the leading coefficient of the function $\left(x\right)=3x(2x-4)$ ?
2. -12
3. 2
4. 3
5. 6
6. What is the domain of the polynomial function $\left(x\right)=2x^{2}- 2x+1$ ?
7. $\left\{x\in R\right\}$
8. $\left\{y\in R\right\}$
9. $\left\{x\leq \frac{1}{2}, x\in R\right\}$
10. $\left\{x\geq \frac{1}{2}, x\in R\right\}$
11. What is the minimum possible number of x-intercepts for the graph of a quadratic function ?
12. 0
13. 1
14. 2
15. 3
16. What is the *y*-intercept of the graph of the function ?

(A) 1

(B) 2

(C) 3

(D) 4

1. From which quadrants does the graph of  extend?

(A) II to I

(B) II to IV

(C) III to I

(D) III to IV

1. Which function passes through the point ?

(A) 

(B) 

(C) 

(D) 

1. Which equation best represents a polynomial function extending from Quadrant III to Quadrant I with three *x*-intercepts?
2. $f\left(x\right)=-3 x^{2}- 2x+1$
3. $f\left(x\right)=-3 x^{3}- 2x$
4. $f\left(x\right)=3 x^{3}- 2x$
5. $f\left(x\right)=3 x^{2}- 2x+1$
6. How many possible turning points does a cubic polynomial have ?
7. 0
8. 1 or 2
9. 1, 2 or 3
10. 0, 1 or 2
11. Which equation best represents the regression function that models the data?

|  |  |
| --- | --- |
| X | Y |
| -7 | -5 |
| -5 | 1 |
| -4 | 2 |
| -1 | 4 |
| 1 | 3 |
| 4 | 1 |

1. $y=0.44x+1.89$
2. $y=0.19x^{2}- 0.13x+4.16$
3. $y=0.01x^{3}-0.11x^{2}- 0.43x+3.58$
4. $y=0.02x^{3}- 0.12x^{2}- 0.44x+3.58$
5. Which graph best represents a function with the characteristics listed below?
* Three x-intercepts
* Extending from Quadrant II to Quadrant IV

(A)

(B)

(C)

(D)

1. Given the table, the scatter plot and the curve of best fit of the polynomial *f*(*x*), what is the value of *f*(5)?



|  |  |
| --- | --- |
| x | y |
| 2 | 5 |
| 4 | 24 |
| 6 | 12 |
| 8 | 0 |
| 10 | 23 |

(A) 2

(B) 9

(C) 18

(D) 20

1. Which of the following equations **DOES NOT** represent a polynomial function?
2. $f\left(x\right)= 3^{x}$
3. $f\left(x\right)= -2x+1$
4. $f\left(x\right)=3x^{2}$
5. $f\left(x\right)=3x^{3}- 2x^{2}+ 3x-2$

**Answer ALL of the following in the spaces provided. Show ALL work for full credit!**

1. Sketch two possible graphs that are different, yet are both cubic functions with negative leading coefficients and negative y-intercepts. Explain why (how) the graphs you have sketched are different in terms of turning points, x-intercepts, etc **(4%).**

 Graph 1: Graph 2:



|  |
| --- |
|   |
|  |
|  |
|  |

1. Given the function , complete the table to describe its characteristics. **(8%)**

|  |  |
| --- | --- |
| *y*-intercept |  |
| end behaviour(left and right) |  |
| Domain |  |
| Range |  |
| # of turning points |  |
| Max # of possible*x*-intercepts |  |

 (ii) Explain why the graph of this function is not a parabola.

|  |
| --- |
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|  |

1. Consider the data in the table.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *x* | –8 | –6 | –4 | –1 | 4 | 6 | 9 | 12 | 20 |
| *y* | 135 | 81 | 65 | 56 | 51 | 48 | 32 | 8 | –144 |

1. Use technology to create a scatter plot and to determine the equation that **best represents** the data rounding to the nearest hundredth? **(3%)**
2. Use your equation to extrapolate the value of y when x = -10. **(2%)**