Algebra 2 Name: _____
Final Exam Review Spring 2017 Date: _____ Block: _____

You must show work (separate paper) and circle your final answer.

UNIT 1

1.) Simplify: $(5-2i)(3+7i)$

2.) Simplify: $\dfrac{4+7i}{1-2i}$

3.) What are the solutions to the equation $x^2+8x+25=0$?

4.). Factor $3x^2+10x-8$.

5.) Find the missing values so that x^2+bx+c is a perfect square trinomial.

a) $x^2+10x+c;\ c=$ _____ b) $x^2-16x+c;\ c=$ _____

UNIT 2

6.) Use binomial theorem to expand the binomial $(2x+5)^3$.

7.) Divide: $(x^4-6x^3-40x+33)\div(x-7)$.

8.) Find the difference. $(2x^3-x^2+5x)-(-7x^4+4x^3-6x^2-2x+9)$

9.) If $f(x)=2x-7$ and $p(x)=x-4$, find $p(f(x))$.

10.) Given $f(x)=5x^3-3x^2+2x-7$ and $g(x)=x^3+4x-27$. What is $f(x)-g(x)$?

UNIT 3

11.) Find the zeros of the function: $f(x)=x^3-8x^2-23x+30$.

12.) Solve for *x*: $x^4=8x^3-12x^2$.

13.) Find all the solutions of $x^4-11x^2+24=0$

14.) How many zeros does the function have? Explain how you know. $f(x)=x^5+3x^3-6x^2-40$

15.) If one of the solutions of a polynomial equation is $-5-4i$, what is another solution?

16.) Use the graph to answer A-H below. Round answers to the nearest tenth.

A. y-intercept: _____

B. zero(s): _____

C. Relative Minimum: _____

Relative Maximum: _____

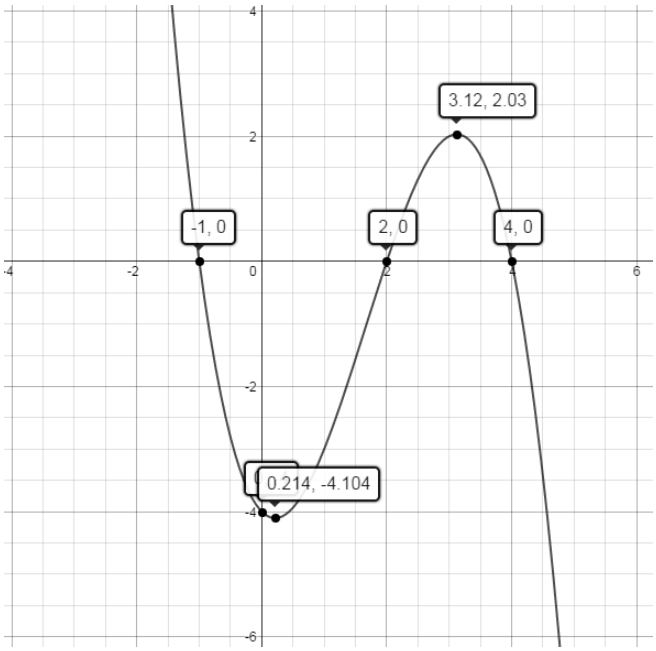
Absolute Minimum: _____

Absolute Maximum: _____

D. Domain: _____

E. Range: _____

F. Intervals of increase or decrease:



G. End behavior $as\ x \to -\infty,\ f(x) \to$ ____
$as\ x \to +\infty,\ f(x) \to$ ____

Critical points on the graph (hard to read):
$(-1,0), (2,0), (4,0), (0,-4), (0.2,-4.1), (3.1,2.0)$

H. Is the function odd, even or neither? _____ Explain.

17.) What type of symmetry does an even function have?_____

an odd function?_____

18.) Give the end behavior of (each) of the following functions.

A) $f(x) = x^6 - 7x^3 = 14x + 41$
as $x \to$ _____, $f(x) \to$ _____
as $x \to$ _____, $f(x) \to$ _____

B) $g(x) = -2x^4 + x^2 + 71$
as $x \to$ _____, $f(x) \to$ _____
as $x \to$ _____, $f(x) \to$ _____

C) $h(x) = x^3 + 5x^2 - 7x + 71$
as $x \to$ _____, $f(x) \to$ _____
as $x \to$ _____, $f(x) \to$ _____

D) $j(x) = -12x^3 + x^2 + 7x - 71$
as $x \to$ _____, $f(x) \to$ _____
as $x \to$ _____, $f(x) \to$ _____

UNIT 4

19.) Graph the function $f(x)=\sqrt{x+1}-3$; state the domain and range.

20-22: Simplify each expression using properties of rational exponents.

20.) $3x^{\frac{2}{3}}\cdot 6x^{\frac{4}{3}}\cdot 2x^{5}$

21.) $\dfrac{x^{\frac{7}{5}}}{x^{\frac{4}{5}}}$

22.) $\left(16x^{-4}y^{20}\right)^{\frac{1}{4}}$

23-25: Simplify each expression using properties of rational exponents.

23.) $\sqrt[4]{81x^{18}y^{8}}$

24.) $5\sqrt{28}+2\sqrt{63}$

25.) $\dfrac{10}{\sqrt{2}}$

26-28: Solve each equation and check for extraneous solutions.

26.) $4x^{\frac{1}{3}}=32$

27.) $17=4\sqrt{(x+6)}+5$

28.) $(x-9)^{6}=238$

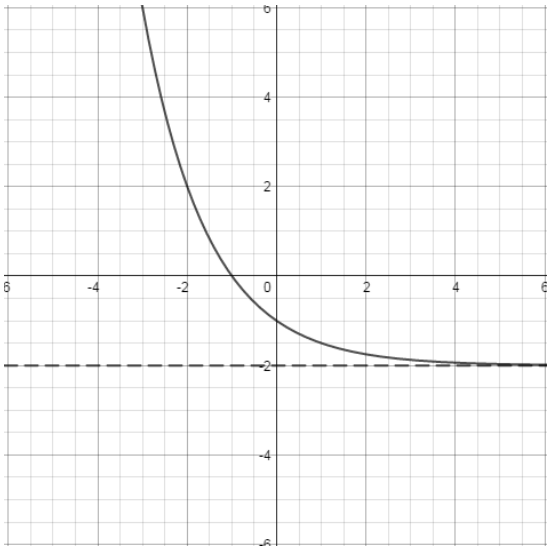
UNIT 5

29.) A new car purchased for $23,500 depreciates at a rate of $12.5% per year. What is the value of the car after 4 years?

30.) You deposit $6000.00 in an account that pays 3.8% annual interest compounded monthly. How much money do you have in the account after 8 years?

31-32: Refer to the graph at right.

31.) State the domain and range of the exponential function graphed.



32.) What is the best equation of the function based on the graph?

A. $f(x)=-2^{x}-3$

B. $f(x)=-2^{x+1}-2$

C. $f(x)=-\left(\dfrac{1}{2}\right)^{x+1}-2$

D. $f(x)=\left(\dfrac{1}{2}\right)^{x}-2$

33.) Solve for *x*: $9^{2x+1}=27^{x-5}$.

34.) The parent function $f(x)=\left(\dfrac{1}{2}\right)^{x}$ has been vertically stretched by a factor of 5, shifted left 4 units and up 12 units. What is the equation of the new function?

UNIT 6

35.) Solve for *x*: $5^{x+2} = 22$.

36.) Solve for *x*: $7e^{x-5} = 28$.

37.) Expand the expression $\ln \frac{y^2 z^4}{x^3}$.

38.) Condense the expression $2\log x + \log 5 - 3\log y$.

39.) Write a function that will give the following transformations from the parent graph $f(x) = \log x$. Reflection across the *x*-axis, a vertical compression by a factor of 2/3, horizontal shift 4 units to the left, and vertical shift 1 unit down.

40.) Solve for *x*: $\log_7 x = -2$.

41.) Solve the equation $\log_2(10x + 8) = 4$.

UNIT 7

42.) Match the sample of students with the correct sampling method.

_____ Every 7th student on a class list	A. self-selected
_____ Mail a response card	B. convenience
_____ The 1st 40 students who enter the office	C. simple random
_____ Select students using number generator	D. systematic

43.) According to the 11 PM news, the average price of regular unleaded gasoline in the Atlanta area is $2.37 per gallon with a standard deviation of $0.10.

a) About **what percent** of gas stations should be selling their regular unleaded gasoline between $2.17 and $2.57 per gallon?

b) If 250 random gas stations in the Atlanta area were surveyed, **how many** gas stations should be selling their regular unleaded gasoline between $2.17 and $2.57 per gallon?

44.) Mrs. Allison's students conducted a poll of 500 students and found that 72% of those surveyed plan to attend the semifinal football playoffs at AHS.
a) What is the margin of error for the survey?
b) Find the interval that is likely to contain the true population percent.

45.) The time taken to assemble a car in a certain plant is a random variable having a normal distribution with a mean of of 20 hours and a standard deviation of 2 hours. What is the probability that a car can be assembled at this plant in a period of time less than 19.5 hours?

46.) The class average on a math test was 78 and the standard deviation was 4.2. Find the z-score for a test score of 90.