**REVIEW #4**

**COMMON CORE EXAM QUESTIONS**

**UNIT 9**

**PART III** (4 points)

1. Graph  and  for  on the set of axes below.



State which function, *f(x)* or *g(x)*, has a greater value when . Justify your reasoning.

**PART I** (2 points)

2. The range of the function defined as  is

(1)  (3) 

(2)  (4) 

**PART II** (2 points)

3. The value, *v(t)*, of a car depreciates according to the function , where *P* is the purchase price of the car and *t* is the time, in years, since the car was purchased. State the percent that the value of the car *decreases* by each year. Justify your answer.

**PART I** (2 points)

4. The 2014 winner of the Boston Marathon runs as many as 120 miles per week. During the last few weeks of his training for an event, his mileage can be modeled by , where *w* represents the number of weeks since training began. Which statement is true about the model ?

(1) The number of miles he runs will increase by 90% each week.

(2) The number of miles he runs will be 10% of the previous week.

(3) represents the total mileage run in a given week.

(4) *w* represents the number of weeks left until his marathon.

**PART I** (2 points)

5. If a population of 100 cells triples every hour, which function represents *p(t)*, the population after *t* hours?

(1)  (3) 

(2)  (4) 

**PART I**(2 points)

6. Anne invested $1000 in an account with a 1.3% annual interest rate. She made no deposits or withdrawals on the account for 2 years. If interest was compounded annually, which equation represents the balance in the account after the 2 years?

(1)  (3) 

(2)  (4) 

**PART I**(2 points)

7. Marco’s $15,000 car depreciates in value at a rate of 19% per year. The value, *V*, after *t* years can be modeled by the function . Which function is equivalent to the original function?

(1)  (3) 

(2)  (4) 

**UNIT 10**

**PART I** (2 points)

8. To keep track of his profits, the owner of a carnival booth decided to model his ticket sales on a graph. He found that his profits only declined when he sold between 10 and 40 tickets. Which graph could represent his profits?

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**PART I** (2 points)

9. Which graph represents ?



**PART I** (2 points)

10. What is the *minimum* value of the function ?

(1) -2 (3) 3

(2) 2 (4) -3

**PART III** (4 points)

11. On the set of axes below, graph .



**PART III** (4 points)

12. Graph  and  on the grid below.

Does ? Use your graph to explain why or why not.

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**PART I** (2 points)

13. The function *h(x)*, which is graphed below, and the function  are given.



Which statements about these functions are true?

1. *g(x)* has a lower minimum value than *h(x)*.
2. For all values of *x*, .
3. For any value of *x*, .

(1) I and II, only (3) II and III, only

(2) I and III, only (4) I, II, and III

**PART II** (2 points)

14. Determine and state whether the sequence 1, 3, 9, 27, … displays exponential behavior. Explain how you arrived at your decision.

**PART I** (2 points)

15. One characteristic of all linear functions is that they change by

(1) equal factors over equal intervals

(2) unequal factors over equal intervals

(3) equal differences over equal intervals

(4) unequal differences over equal intervals

**PART I** (2 points)

16. Which scenario represents exponential growth?

(1) A water tank is filled at a rate of 2 gallons/minute.

(2) A vine grows 6 inches every week.

(3) A species of fly doubles its population every month during the

summer.

(4) A car increases its distance from a garage as it travels at a

constant speed of 25 miles per hour.

**PART III** (4 points)

17. Michael has $10 in his savings account. Option 1 will add $100 to his account each week. Option 2 will double the amount in his account at the end of each week.

Write a function in terms of *x* to model each option of saving.

Michael wants to have at least $700 in his account at the end of 7 weeks to buy a mountain bike. Determine which option(s) will enable him to reach his goal. Justify your answer.

**PART II** (2 points)

18. Samantha purchases a package of sugar cookies. The nutrition label states that each serving size of 3 cookies contains 160 Calories. Samantha creates the graph below showing the number of cookies eaten and the number of Calories consumed.



Explain why it is appropriate for Samantha to draw a line through the points on the graph.

**PART I** (2 points)

19. Nancy works for a company that offers two types of savings plans. Plan *A* is represented on the graph below.



Plan *B* is represented by the function , where *x* is the number of weeks. Nancy wants to have the highest savings possible after a year. Nancy picks Plan *B*.

Her decision is

(1) correct, because Plan *B* is an exponential function and will

increase at a faster rate.

(2) correct, because Plan *B* is a quadratic function and will increase at a faster rate.

(3) incorrect, because Plan *A* will have a higher value after 1 year

(4) incorrect, because Plan *B* is a quadratic function and will

increase at a slower rate

**PART I** (2 points)

20. In 2014, the cost to mail a letter was 49 cents for up to one ounce. Every additional ounce cost 21 cents. Which recursive function could be used to determine the cost of a 3-ounce letter, in cents?

(1) 

(2) 

(3) 

(4) 

**PART I** (2 points)

21. A sequence of blocks is shown in the diagram below.



This sequence can be defined by the recursive function  and . Assuming the pattern continues, how many blocks will there by when ?

(1) 13 (3) 28

(2) 21 (4) 36

**PART I** (2 points)

22. Given the function *f(n)* defined by the following:



Which set could represent the range of the function?

(1)  (3) 

(2)  (4) 

**PART II** (2 points)

23. Describe the effect that each transformation below has on the function , where .





**PART I** (2 points)

24. In the functions  and , *k* is a positive integer.

If *k* is replaced by , which statement about these new functions is true?

(1) The graphs of both *f(x)* and *g(x)* become wider.

(2) The graph of *f(x)* becomes narrower and the graph of *g(x)* shifts

left.

(3) The graphs of both *f(x)* and *g(x)* shift vertically.

(4) The graph of *f(x)* shifts left and the graph of *g(x)* becomes

wider.

**PART I** (2 points)

25. When the function  is multiplied by the value of *a*, where , the graph of the new function, 

(1) opens upward and is wider

(2) opens upward and is narrower

(3) opens downward and is wider

(4) opens downward and is narrower

**UNIT 11**

**PART I** (2 points)

26. The heights, in inches, of 12 students are listed below.

61, 67, 72, 62, 65, 59, 60, 79, 60, 61, 64, 63

Which statement best describes the spread of these data?

(1) The set of data is evenly spread.

(2) The median of the data is 59.5.

(3) The set of data is skewed because 59 is the only value below

60.

(4) 79 is an outlier, which would affect the standard deviation of these data.

**PART I** (2 points)

27. Corinne is planning a beach vacation in July and is analyzing daily high temperatures for her potential destination. She would like to choose a destination with a high median temperature and a small interquartile range. She constructed box plots shown in the diagram below.



Which destination has a median temperature above 80 degrees and the smallest interquartile range?

(1) Ocean Beach (3) Serene Shores

(2) Whispering Palms (4) Pelican Beach

**PART I** (2 points)

28. A student plotted the data from a sleep study as shown in the graph below.



The student used the equation of the line  to model the data. What does the rate of change represent in terms of these data?

(1) The average number of hours of sleep per day increases 0.09 hour per year of age.

(2) The average number of hours of sleep per day decreases 0.09 hour per year of age.

(3) The average number of hours of sleep per day increases 9.24 hours per year of age.

(4) The average number of hours of sleep per day decreases 9.24 hours per year of age.

**PART III** (4 points)

29. Omar has a piece of rope. He ties a knot in the rope and measures the new length of the rope. He then repeats this process several times. Some of the data collected are listed in the table below.



State, to the *nearest tenth*, the linear regression equation that approximates the length, *y*, of the rope after tying *x* knots.

Explain what the *y*-intercept means in the context of the problem.

Explain what the slope means in the context of the problem.

**PART I** (2 points)

30. Jill invests $400 in a savings bond. The value of the bond, *V(x)*, in hundreds of dollars after *x* years is illustrated in the table below.



Which equation and statement illustrate the approximate value of the bond in hundreds of dollars over time in years?

(1) , and it grows.

(2) , and it decays.

(3) , and it grows.

(4) , and it decays.

**PART I** (2 points)

31. What type of relationship exists between the number of pages printed on a printer and the amount of ink used by that printer?

(1) positive correlation, but not causal

(2) positive correlation, and causal

(3) negative correlation, but not causal

(4) negative correlation, and causal

**PART I** (2 points)

32. Bella recorded data and used her graphing calculator to find the equation for the line of best fit. She then used the correlation coefficient to determine the strength of the linear fit.

Which correlation coefficient represents the strongest linear relationship?

(1) 0.9 (3) -0.3

(2) 0.5 (4) -0.8