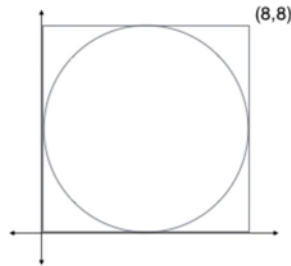Name: _____ Hr: ____

See instructional videos at www.AlgebraNinja.com

1. Given functions $f(x) = 4x - 5$ *and* $g(x) = \frac{2}{3x}$ which of the following would be equivalent to $f(g(x))$? *[6,708]*

   A. $\frac{8}{3x} - 5$

   B. $4x^2 - 5$

   C. $\frac{2}{3(4x-5)}$

   D. -4

   E. $\left(\frac{1}{x}\right) - 5$

2. Given $sin\theta < 0$ *and* $tan\theta = -1$ *what is* θ. *[6,704]*

   F. $\frac{\pi}{4}$

   G. $\frac{7\pi}{6}$

   H. $\frac{4\pi}{3}$

   J. $\frac{3\pi}{2}$

   K. $\frac{7\pi}{4}$

3. *Solve* $log2^x + log8 = log64$ for x. *[6,707]*

   A. $\sqrt{8}$

   B. 3

   C. 2

   D. 1/3

   E. 0

4. Which of the below are equivalent to $e \bullet log\ 10^4$ *[6,707]*

   F. 40000

   G. e^4

   H. $4e \bullet ln\ e^1$

   J. $40e$

   K. *no solution*

5. If the point (0 , 2) is your starting point and (1,4) is next, followed by (2,8) write an exponential growth equation for this data: *[6,702]*

   A. $y = 2(2x)^2$

   B $y = 2(2)^x$

   C. $y = 2(x)^2$

   D. $y = 2(2x)$

   E. $y = 2(x)^3$

6. Sue has made a drawing using math functions. Her parabola $y=(x+1)^2 - 2$ needs to be moved one spot to the right and up three spots. Which of these would work? *[16,706]*

   F. $y = (x+1)^2 + 1$

   G. $y = x^2 + 1$

   H. $y = x^2 + 8x + 11$

   J. $y = x^2 + 4x + 5$

   K. $y = (x+2)^2 - 5$

7. In a geometric sequence with a starting value of 3 and a common ratio between terms of 1.7, what is the 14th term, rounded to the nearest whole number? *[6,703]*

   A. 27

   B. 1683

   C. 2971

   D. 5051

   E. 3^{14}

8. Given the general equation for a parabola $y=ax^2+a$, if a>0 which of the following statements must be true of the parabola?

   I.   The y intercept must be positive
   II.   The roots are positive
   III. The vertex is above the x axis. *[16,705]*

   F. I is true and II and III are false
   G. II is true and I and III are false
   H. I and II are true
   J. II and III are true
   K. I and III are true

9. The graph of a certain trig function has a y intercept of 1. Which of the following answers would fit this situation? *[6,705]*

   A. both y=cos x and y=sin (x + 2)
   B. both y=cos x and y=tan x
   C. both y=sin x and y=cos x +1
   D. both y=tan x and y=sin x
   E. both y=tan x + 1 and y=sin x + 1

10. Find the mean, median and mode for the following data set: {24,24,24,29,30,41} ? Round to the tenths place. *[19,701]*

   F. mean: 29, median: 27, mode: 24
   G. mean: 28.7, median: 24,29 mode: 24
   H. mean: 28.7, median: 26.5, mode: 24
   J. mean: 26.5, median: 28.7, mode: 24
   K. *none of the above are correct*
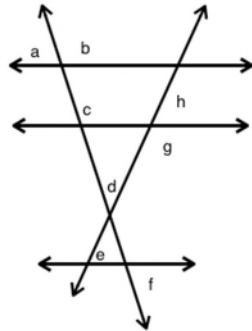
11. Gas prices decreased from year 1 to year 2 by 3%. From year 2 to year 3 they increased by 6%. If in year 3 they were $3.99, what was the price in year 1? [16,701]

A. $3.50
B. $3.62
C. $3.88
D. $3.89
E. $4.40

12. A circle is circumscribed in a square with sides of 8units. What is the probability that a dart thrown at the square will hit outside of the circle? [7,702]

(8,8)

F. .785
G. .215
H. .196
J. .151
K. $(x - 4)^2 + (y - 4)^2 = 16$

13. Given the three horizontal lines that appear to be parallel ARE parallel, and angle b is 125° and angle e is 75°, what is the measure of angle d? [7,704]

A. 50°
B. 55°
C. 60°
D. 65°
E. 80°

14. Josh has an average test grade of 93.5%. His homework counts for 15% of his grade and his tests count for 85%. Given that he performs 30% better on his tests than his homework, what was his weighted average? [19,601]

F. 91.5%
G. 90%
H. 89.5%
J. 89%
K. 87.5%

15. A line segment has an endpoint of (2,3) and a midpoint of (5.5,a). Its other endpoint? [7,511]

A. $(8,3a)$
B. $(8, 3 + a)$
C. $(9, 3 + a)$
D. $(9, 3 + 2a)$
E. $(9, 2a - 3)$

16. The polynomial $f(x) = x^3 + 2x^2 - 2$ is divided by x-1. What is the remainder? [1,703]

F. -1
G. 0
H. 1
J. 4
K. $x^2 - 3x$

17. The inequality $x^2 - 4 \leq 0$ yields which of the following solution sets? [1,702]

A. $-2 \leq x \leq 2$
B. $0 \leq x \leq 2$
C. $2 \leq x \leq -2$
D. $-2 \leq x$
E. *there is no solution*

18. The Probability of $A \cup B$ is 85%. The probability of $A \cap B$ is 20%. The probability of A is 45%. What is the probability of B (p(B)). [19,704]

F. 30%
G. 40%
H. 60%
J. 70%
K. 80%

19. At Samantha's Smoothies, they make a blended treat by combining 2 of 4 kinds of ice cream with 1 of 5 kinds of fruit. How many different smoothies can be made? [19,603]

A. 10
B. 25
C. 30
D. 60
E. 120

20. Use Trig Identities to simplify $\frac{1}{cot\theta sin\theta}$: [6,706]

F. $sin\theta$
G. $sec\theta$
H. $tan\theta$
J. $cot\theta$
K. $csc\theta$