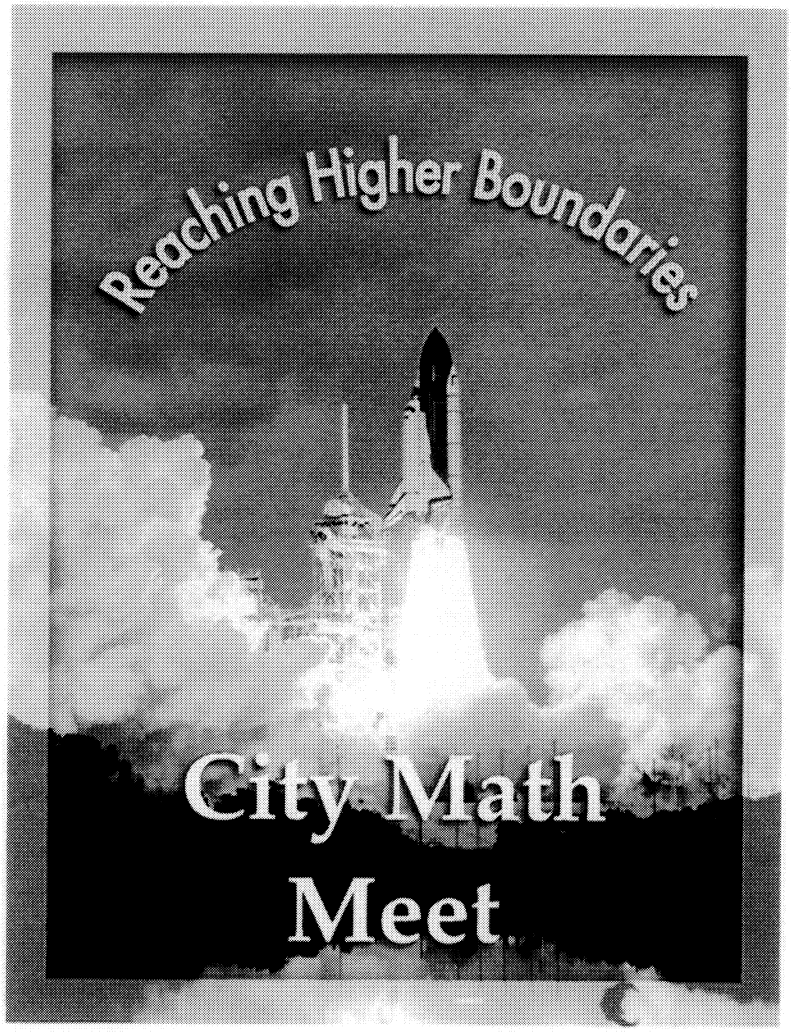
BROWNSVILLE CITY MATH MEET
LOPEZ HIGH SCHOOL

APRIL 5, 2006



ALGEBRA II

NAME_____ SCHOOL_____

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ALGEBRA II TEST

1. Perform the indicated operation: $\left(8x^4 - 12x^3 - 2x^2 + 18x - 11\right) \div \left(2x^2 - 3\right)$

   A. $4x^2 - 6x - 5 + \frac{4}{2x^2 - 3}$

   B. $4x^2 - 6x + 5 + \frac{4}{2x^2 - 3}$

   C. $4x^2 - 6x + 5 + \frac{6}{2x^2 - 3}$

   D. $4x^2 - 6x + 5 - \frac{4}{2x^2 - 3}$

2. Perform the indicated operation: $\frac{6x - 2x^2 + 3c - cx}{x^2 - 9} * \frac{x^2 - x - 12}{x^2 - 2x - 8}$

   A. $-\frac{2x - c}{x + 2}$

   B. $-\frac{2x + c}{x - 2}$

   C. $\frac{2x + c}{x - 2}$

   D. $-\frac{2x + c}{x + 2}$

3. Perform the indicated operation and simplify: $\frac{2}{\sqrt[3]{3}} + \frac{2}{\sqrt[3]{81}} - \frac{3}{\sqrt[3]{24}}$

   A. $\frac{5\sqrt[3]{3}}{12}$

   B. $\frac{11\sqrt[3]{9}}{15}$

   C. $\frac{7\sqrt[3]{9}}{18}$

   D. $\frac{8\sqrt[3]{3}}{15}$

4. Anoa bought two plots of land for a total of $110,000. When she sold the first plot, she made a profit of 20%. When she sold the second plot, she lost 10%. If her total profit is $10,600, how much did she pay for the second plot of land?

   A. $38,000
   B. $35,000
   C. $72,000
   D. $68,000

Simplify $\frac{8+\sqrt{-48}}{18}$ in simplest form.

A. $\frac{4}{9}-\frac{2\sqrt{3}}{9}i$

B. $\frac{4}{9}-\frac{2\sqrt{3}}{9}$

C. $\frac{4}{9}+\frac{2\sqrt{3}}{9}i$

D. $\frac{4}{9}+\frac{2\sqrt{3}}{9}$

A square lawn has an area 648 ft^2. A sprinkler placed at the center of the lawn sprays water in a circular pattern that just covers the lawn. What is the radius of the circle?

A. 15 ft.
B. 18 ft.
C. 20 ft.
D. 21 ft.

If $(3x-2)^2+3(3x-2)=4$, then what would be the sum of its roots?

A. $-\frac{1}{2}$

B. $\frac{1}{3}$

C. $\frac{2}{3}$

D. $-\frac{2}{5}$

If $\sqrt{2x+8}=3x+8$, then what would be the value of 3x?

A. 6
B. 12
C. 15
D. −9

Solve $6x^2+7x<20$ writing the solution in interval notation.

A. $\left(-\frac{4}{3},\frac{5}{2}\right)$

B. $\left(-\infty,-\frac{4}{3}\right)\cup\left(\frac{5}{2},\infty\right)$

C. $\left(-\infty,-\frac{5}{2}\right)\cup\left(\frac{4}{3},\infty\right)$

D. $\left(-\frac{5}{2},\frac{4}{3}\right)$

Solve $|2x-9|\geq 7$ writing the solution in interval notation.

A. $(1,8)$

B. $[1,8]$

C. $(-\infty,1]\cup[8,\infty)$

D. $(-\infty,1)\cup(8,\infty)$

11. If $f(x) = -8x + 3$ and $g(x) = 3x + 7$, find $(f \circ g)(a - 2)$.

A. $-24a - 11$
B. $-24a + 64$
C. $-24a + 52$
D. $-24a - 5$

12. Find the equation of the line passing through $(-4, 7)$ and perpendicular to $5x + 3y - 4 = 0$.

A. $5x + 3y = 1$
B. $5x - 3y = -41$
C. $3x + 5y = 23$
D. $3x - 5y = -47$

13. Decide whether $x^2 - y = 4$ is symmetric with respect to the

A. x - axis
B. y - axis
C. origin
D. none of these

14. What is the maximum number of negative real zeros for $f(x) = 5x^4 + 7x^3 - 3x^2 + 4x - 7$.

A. 4
B. 3
C. 1
D. 2

15. What is the Least Upper Bound for the zeros of $f(x) = 4x^4 - 3x^3 - 8x^2 + 2x + 5$?

A. 4
B. 2
C. 3
D. 1

16. Which equation is a vertical asymptote of $\dfrac{8x^2 - 2x - 3}{10x^2 + 11x - 6}$?

A. none
B. $x = \frac{3}{2}$
C. $x = \frac{2}{5}$
D. $y = \frac{3}{4}$

17. Which equation is the inverse of $4x - 7y + 8 = 0$?

A. $y = \frac{7}{4}x - 2$
B. $y = \frac{4}{7}x + \frac{8}{7}$
C. $y = \frac{4}{7}x - 2$
D. $y = \frac{7}{4}x + 2$

18. The force of the wind blowing on a vertical surface varies jointly as the area of the surface and the square of the velocity. If a wind of 30 mph exerts a force of 45 lb on a surface of ½ ft ^{2}, how much force will a wind of 60 mph place on a surface of ¼ ft ^{2}?

A. 80 lb
B. 135 lb
C. 60 lb
D. 90 lb

19. If $25^{2x+3} = 125^{x-1}$, what would be the value of 2x?

A. − 12
B. 8
C. − 18
D. 14

20. Solve $5x = 8^{\log_8 15}$

A. 3
B. 5
C. 2
D. 4

21. Solve $\log_3 x + \log_3 (x - 2) = \log_3 35$ for the variable x.

A. 4
B. 7
C. 9
D. 6

22. Solve $8e^{2x+1} = 25$ for the variable x.

A. 0.0842
B. 0.0681
C. 0.0819
D. 0.0697

23. How long will it take any quantity of iodine 131 to decay to 60% of its initial amount, knowing that it decays according to the function $A(t) = A_o e^{-.087t}$, where t is time in days?

A. 5.87 days
B. 4.62 days
C. 6.35 days
D. 3.19 days

24. If $4x + 3y = 19$ and $3x + 2y = 12$, then what is the value of $x + y$?

A. 11
B. 4
C. 7
D. 6

25. Solve $3x + 5y + z - 4 = 0$, $2x - 3y + 2z + 2 = 0$, and $x - y + 3z - 12 = 0$ for the value of y.

A. 2
B. 6
C. -4
D. -1

26. Given the system of equations $2x + 3y - 4z + 7 = 0$, $x - 4y - z + 6 = 0$, and $3x - 2y + 3z + 5 = 0$, what is element a_{13} in D_z according to Cramer's rule?

A. -4
B. -7
C. -1
D. -5

27. Solve $\begin{vmatrix} 3 & 5 \\ -2 & x \end{vmatrix} = 22$ for the variable x.

A. -2
B. 6
C. -3
D. 4

28. Find the partial fraction decomposition for $\frac{3}{2x(4x-1)}$.

A. $\frac{3}{2x} + \frac{6}{4x-1}$
B. $\frac{3}{2x} + \frac{-6}{4x-1}$
C. $\frac{-3}{2x} + \frac{6}{4x-1}$
D. $\frac{-3}{2x} + \frac{-6}{4x-1}$

29. Solve $2x^2 - y^2 = -2$ and $x + y = 3$ for the value(s) of y.

A. $1, -7$
B. $2, 10$
C. $-7, 2$
D. $1, 10$

30. The hypotenuse of a right triangle is 3 m longer than twice the length of the shortest leg. Find the length of the other leg if it is 1 m shorter than the hypotenuse.

A. 5
B. 4
C. 12
D. 13

31. Perform the indicated operation: $\begin{bmatrix} 3 & -2 & 7 \\ 2 & 0 & 4 \end{bmatrix}\begin{bmatrix} 8 & 2 \\ 0 & 5 \\ -3 & 1 \end{bmatrix}$

A. No solution
B. $\begin{bmatrix} -6 & 8 \\ 7 & 5 \end{bmatrix}$
C. $\begin{bmatrix} 3 & -6 \\ -2 & 5 \end{bmatrix}$
D. $\begin{bmatrix} 3 & 3 \\ 4 & 8 \end{bmatrix}$

32. Find the inverse of $\begin{bmatrix} 4 & 1 \\ 7 & 2 \end{bmatrix}$

A. Does not exist
B. $\begin{bmatrix} 2 & 1 \\ 7 & 4 \end{bmatrix}$
C. $\begin{bmatrix} 2 & 7 \\ 1 & 4 \end{bmatrix}$
D. $\begin{bmatrix} 2 & -1 \\ -7 & 4 \end{bmatrix}$

33. Find the vertex for $x = y^2 - 8y + 12$.

A. $(-4, 4)$
B. $(2, 4)$
C. $(-1, -4)$
D. $(-4, 2)$

34. Give the equation of the directrix for $(y + 4)^2 = 20(x - 2)$.

A. $y = -3$
B. $x = -3$
C. $x = 2$
D. $y = -2$

35. Write an equation for the parabola having a vertex at (6,5) and a focus at (6,8).

A. $(x - 6)^2 = 12(y - 5)$
B. $(x + 6)^2 = 12(y + 5)$
C. $(x + 6)^2 = 16(y + 8)$
D. $(x - 6)^2 = 16(y - 5)$

36. Write an equation for a hyperbola with center at (6, −5); with a vertical conjugate axis of length 14; and c = 9.

A. $\frac{(x-6)^2}{32}+\frac{(y+5)^2}{49}=1$

B. $\frac{(x+6)^2}{32}-\frac{(y-5)^2}{49}=1$

C. $\frac{(x-6)^2}{32}-\frac{(y+5)^2}{49}=1$

D. $\frac{(y+5)^2}{32}-\frac{(x-6)^2}{49}=1$

37. Write an equation for an ellipse with center at (−2. 3); focus at (−2, −2); and vertex at (−2, 9).

A. $\frac{(y-3)^2}{11}+\frac{(x+2)^2}{36}=1$

B. $\frac{(x+2)^2}{36}+\frac{(y-3)^2}{11}=1$

C. $\frac{(y-3)^2}{36}+\frac{(x+2)^2}{11}=1$

D. $\frac{(x+2)^2}{11}+\frac{(y-3)^2}{36}=1$

38. What is the radius of the circle $x^2 + y^2 + 10x - 4y + 13 = 0$?

A. 4
B. 2
C. 6
D. 5

39. Identify the conic $3y^2 - 6x + 4y - 2 = 0$.

A. Circle
B. Parabola
C. Ellipse
D. Hyperbola

40. Find the 50^{th} term of the arithmetic sequence 3, 9, 15,...

A. 303
B. 286
C. 315
D. 297

Evaluate $\sum_{i=2}^{6}(4i-2)$

A. 70
B. 85
C. 66
D. 48

Find the sum of the first 40 terms of the arithmetic sequence 45, 39, 33,...

A. – 3120
B. – 1858
C. – 2880
D. – 2468

Find the seventh term of the geometric sequence 4, 28, 196,...

A. 470856
B. 503246
C. 488896
D. 470596

Find the sum of the first six terms of the geometric sequence having $a_1 = 17$ and $r = -4$.

A. – 13923
B. – 12846
C. – 14822
D. – 13640

A ball is dropped from a height of 12 feet and bounces ⅔ of its height. How far will the ball travel before it comes to rest?

A. 60 feet.
B. 60 feet
C. 70 feet
D. 72 feet

Expand $(3x - y)^4$.

A. $81x^4 - 108x^3y + 54x^2y^2 - 10xy^3 + y^4$
B. $81x^4 - 108x^3y + 56x^2y^2 - 12xy^3 + y^4$
C. $81x^4 - 108x^3y + 54x^2y^2 - 12xy^3 + y^4$
D. $81x^4 - 108x^3y + 54x^2y^2 - 22xy^3 + y^4$

Find the fourth term of $(5x - 2y)^7$.

A. $175000\,x^4y^3$
B. $262500\,x^3y^4$
C. $262500\,x^3y^4$
D. $-175000\,x^4y^3$

48. If a bag contains 5 yellow, 3 white, and 9 blue marbles, how many samples of four can be drawn if the color does not matter?

A. 2380
B. 2248
C. 2398
D. 2268

49. Two marbles are drawn at random from a box containing 6 red, 4 green, and 8 yellow marbles. What is the probability that both of the marbles are not green?

A. $\frac{87}{162}$
B. $\frac{91}{153}$
C. $\frac{7}{9}$
D. $\frac{76}{137}$

50. A bag contains 9 red, 4 yellow, and 11 green marbles. If a marble is drawn at random, what are the odds in favor of not picking a yellow marble?

A. 1 to 1
B. 5 to 1
C. 4 to 11
D. 9 to 4