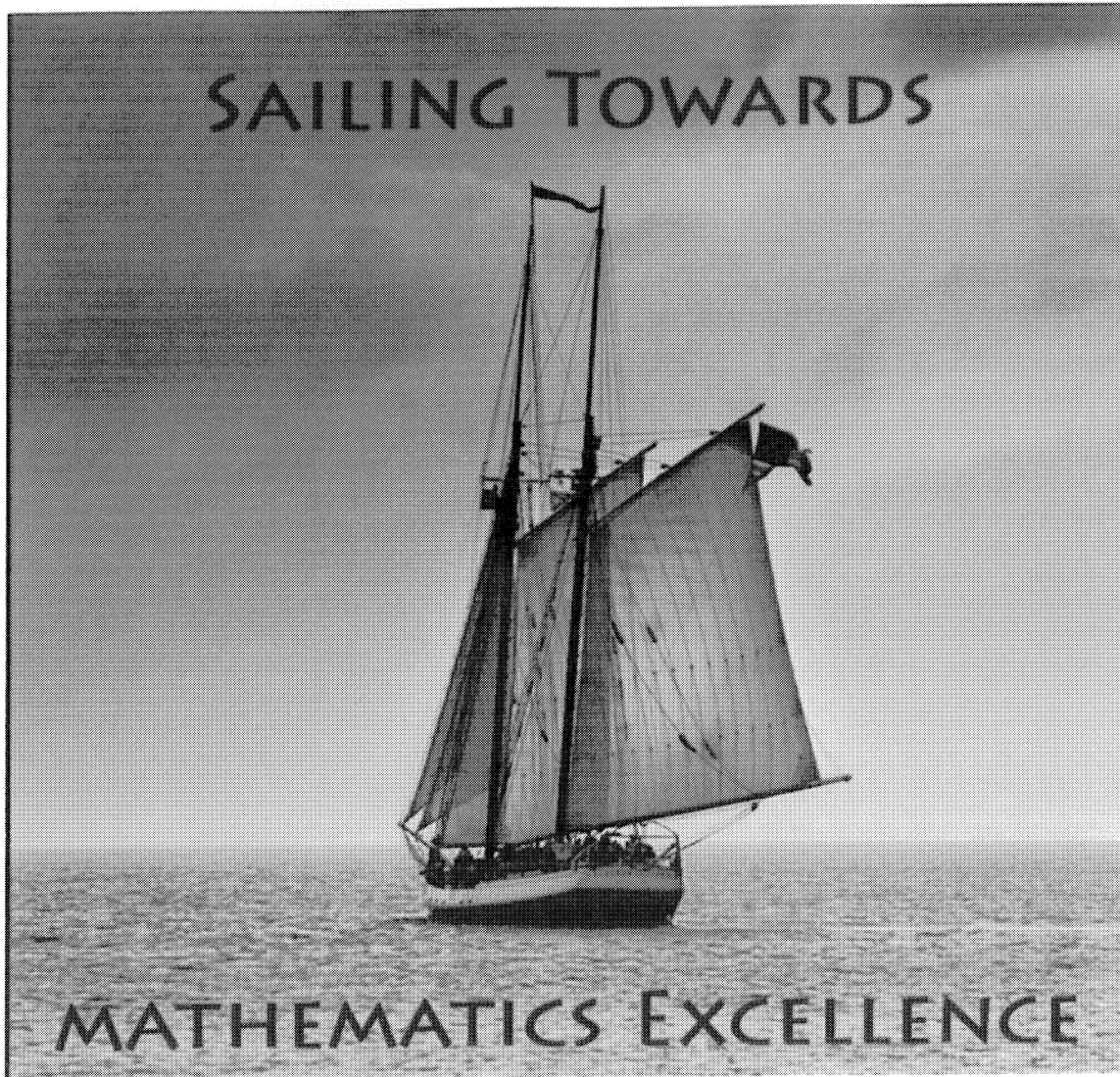


BROWNSVILLE CITY MATH MEET
SIMON RIVERA HIGH SCHOOL

APRIL 25, 2007



ALGEBRA II

NAME _____

SCHOOL _____

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ALGEBRA II TEST

1. Perform the indicated operation: $(12x^4 - 15x^3 - 2x^2 + 10x - 1) \div (3x^2 - 2)$

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

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

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

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

2. Perform the indicated operation: $\frac{3x^2 + 26x - 9}{4x^2 - 25} * \frac{2x^2 - 3x - 20}{x^2 + 5x - 36}$

A. $\frac{3x+1}{2x+5}$

B. $\frac{3x-1}{2x-5}$

C. $\frac{2x+1}{2x-5}$

D. $\frac{3x-1}{2x+5}$

3. Perform the indicated operation and simplify: $\frac{3}{\sqrt[3]{16}} - \frac{5}{\sqrt[3]{2}} + \frac{4}{\sqrt[3]{54}}$

A. $-\frac{11\sqrt[3]{2}}{12}$

B. $\frac{9\sqrt[3]{4}}{8}$

C. $-\frac{13\sqrt[3]{4}}{12}$

D. $-\frac{17\sqrt[3]{2}}{8}$

4. Anoa bought two plots of land for a total of \$110,000. When she sold the first plot, she made a profit of 12%. When she sold the second plot, she lost 2%. If her total profit is \$3,680, how much did she pay for the first plot of land?

A. \$28,000

B. \$40,000

C. \$30,000

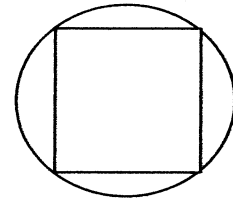
D. \$42,000

5. Simplify $\frac{10 - \sqrt{-54}}{15}$ in simplest form.

- A. $\frac{2}{3} - \frac{\sqrt{6}}{5}i$
- B. $\frac{2}{3} + \frac{\sqrt{6}}{5}$
- C. $\frac{2}{3} + \frac{\sqrt{6}}{5}i$
- D. $\frac{2}{3} - \frac{\sqrt{6}}{5}$

6. A square lawn has an area 300 ft^2 . A sprinkler placed at the center of the lawn sprays water in a circular pattern that just covers the lawn as shown in the figure. What is the radius of the circle?

- A. $5\sqrt{6}$ ft.
- B. 5 ft.
- C. $5\sqrt{2}$ ft.
- D. $5\sqrt{3}$ ft.



7. If $(2x - 1)^2 + 4(2x - 1) = 12$, then what would be the sum of its roots?

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

8. If $2\sqrt{12x + 7} = 4x + 5$, then what would be the value of $2x$?

- A. $-\frac{2}{3}, \frac{4}{3}$
- B. $-\frac{1}{2}, \frac{3}{2}$
- C. $-\frac{1}{6}, \frac{11}{6}$
- D. $-\frac{3}{4}, \frac{5}{4}$

9. Solve $10x^2 + 29x > 21$ writing the solution in interval notation.

- A. $(-\infty, -\frac{3}{5}) \cup (\frac{7}{2}, \infty)$
- B. $(-\infty, -\frac{3}{5}] \cup [\frac{7}{2}, \infty)$
- C. $(-\infty, -\frac{7}{2}) \cup (\frac{3}{5}, \infty)$
- D. $(-\infty, -\frac{7}{2}] \cup [\frac{3}{5}, \infty)$

10. Solve $|3x - 7| \leq 14$ writing the solution in interval notation.

- A. $[-\frac{7}{3}, 7]$
- B. $(-\infty, -\frac{7}{3}) \cup (7, \infty)$
- C. $(-\infty, -7] \cup [\frac{7}{3}, \infty)$
- D. $[-7, \frac{7}{3}]$

11. If $f(x) = -3x + 5$ and $g(x) = -2x - 7$, find $(g \circ f)(a+3)$.
- A. $-5a - 6$
 - B. $6a + 4$
 - C. $-5a + 3$
 - D. $6a + 1$
12. Find the equation of the line passing through $(2, -1)$ and perpendicular to $4x + 3y - 5 = 0$.
- A. $4x - 3y = 11$
 - B. $3x - 4y = 10$
 - C. $3x + 4y = 2$
 - D. $4x + 3y = 5$
13. Decide whether $3x + y^2 = 5$ 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 $f(x) = 6x^4 - 7x^3 - 2x^2 + 8x + 5$.
- A. 1
 - B. 2
 - C. 3
 - D. 4
15. What is the Least Upper Bound for the zeros of $f(x) = 3x^4 - 8x^3 - 5x^2 + 4x + 2$?
- A. 2
 - B. 3
 - C. 4
 - D. 5
16. Which equation is a vertical asymptote of $\frac{6x^2 + x - 2}{12x^2 + 8x - 15}$?
- A. $x = \frac{6}{5}$
 - B. $x = \frac{1}{2}$
 - C. $x = -\frac{2}{3}$
 - D. $x = \frac{5}{6}$
17. Which equation is the inverse of $5x + 2y + 7 = 0$?
- A. $y = -\frac{5}{2}x - 7$
 - B. $y = \frac{5}{2}x + \frac{7}{2}$
 - C. $y = -\frac{2}{5}x - \frac{7}{5}$
 - D. $y = -\frac{5}{2}x - \frac{7}{2}$

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 40 mph exerts a force of 64 lbs on a surface of $\frac{1}{2}$ ft², how much force will a wind of 50 mph place on a surface of $\frac{1}{4}$ ft²?

- A. 50 lbs
- B. 60 lbs
- C. 80 lbs
- D. 90 lbs

19. If $6^{3x-1} = 36^{2x-3}$, what would be the value of $2x$?

- A. -4
- B. 5
- C. 1
- D. 3

20. Solve $7^x = 7^{\log_7 42}$

- A. 3
- B. 5
- C. 6
- D. 8

21. Solve $\log_5 x + \log_5 (x - 4) = \log_5 32$ for the variable x .

- A. 6
- B. 9
- C. 11
- D. 8

22. Solve $9e^{3x-2} = 53$ for the variable x .

- A. 1.258
- B. 1.465
- C. 1.178
- D. 1.334

23. How long will it take any quantity of iodine 131 to decay to 40% of its initial amount, knowing that it decays according to the function $A(t) = A_0 e^{-.087t}$, where t is time in days?

- A. 12.2 days
- B. 9.6 days
- C. 8.7 days
- D. 10.5 days

24. If $5x + 2y = -8$ and $6x + 7y = 18$, then what is the value of $x + y$?

- A. -6
- B. 6
- C. 14
- D. 2

25. Solve $4x - 2y + 5z - 15 = 0$, $2x + 3y + 3z - 27 = 0$, and $3x + 4y - 2z + 7 = 0$ for the value of z .

- A. 7
- B. 4
- C. -5
- D. -3

26. Given the system of equations $7x + 2y - 4z - 2 = 0$, $2x - 5y + z + 3 = 0$, and $4x - 3y + 6z - 9 = 0$, what is element a_{23} in D_y according to Cramer's rule?

- A. 1
- B. -5
- C. -2
- D. 6

27. Solve $\begin{vmatrix} -4 & 2 \\ 5 & x \end{vmatrix} = 14$ for the variable x .

- A. 4
- B. -6
- C. -3
- D. 10

28. Find the partial fraction decomposition for $\frac{31x - 25}{3x(2x - 5)}$.

- A. $\frac{5}{3x} + \frac{7}{2x-5}$
- B. $\frac{4}{3x} + \frac{6}{2x-5}$
- C. $\frac{5}{3x} + \frac{8}{2x-5}$
- D. $\frac{3}{3x} + \frac{7}{2x-5}$

29. Solve $5x^2 - y^2 = -5$ and $2x + y = 1$ for the value(s) of y .

- A. 8
- B. 2
- C. 5
- D. 7

30. The hypotenuse of a right triangle is $4\sqrt{13}$ m long. Find the shortest leg of the triangle if it is 4 m shorter than the other leg.

- A. 9
- B. 8
- C. 5
- D. 7

31. Perform the indicated operation: $\begin{bmatrix} 5 & -3 & 1 \\ -2 & 6 & 4 \end{bmatrix} \begin{bmatrix} 9 & 3 \\ -6 & 4 \\ 2 & 5 \end{bmatrix}$

A. No solution

B. $\begin{bmatrix} 54 & 10 \\ -38 & 26 \end{bmatrix}$

C. $\begin{bmatrix} 65 & 8 \\ -46 & 38 \end{bmatrix}$

D. $\begin{bmatrix} 72 & 6 \\ 54 & 36 \end{bmatrix}$

32. Find the inverse of $\begin{bmatrix} 7 & -4 \\ 5 & -3 \end{bmatrix}$

A. Does not exist

B. $\begin{bmatrix} 3 & -4 \\ 5 & -7 \end{bmatrix}$

C. $\begin{bmatrix} 2 & 7 \\ 1 & 4 \end{bmatrix}$

D. $\begin{bmatrix} -3 & 4 \\ -5 & 7 \end{bmatrix}$

33. Find the vertex for $x = y^2 - 16y + 69$.

A. (8, -5)

B. (3, 5)

C. (5, 8)

D. (-3, 4)

34. Give the equation of the directrix for $(y + 6)^2 = 28(x - 5)$.

A. $y = 2$

B. $x = 2$

C. $y = -2$

D. $x = -2$

35. Write an equation for the parabola having a vertex at $(-5, 4)$ and a focus at $(-5, 7)$.

A. $(x - 5)^2 = 12(y + 4)$

B. $(x + 5)^2 = 16(y - 4)$

C. $(x - 5)^2 = 16(y + 4)$

D. $(x + 5)^2 = 12(y - 4)$

36. Write an equation for a hyperbola with center at $(-4, 7)$; with a vertical conjugate axis of length 10; and $c = 7$.

A. $\frac{(x+4)^2}{24} - \frac{(y-7)^2}{25} = 1$

B. $\frac{(x+4)^2}{28} - \frac{(y-7)^2}{9} = 1$

C. $\frac{(x-4)^2}{24} - \frac{(y+7)^2}{25} = 1$

D. $\frac{(y-7)^2}{24} - \frac{(x+4)^2}{25} = 1$

37. Write an equation for an ellipse with center at $(6, -2)$; focus at $(9, -2)$; and vertex at $(11, -2)$.

A. $\frac{(x-6)^2}{25} - \frac{(y+2)^2}{16} = 1$

B. $\frac{(y+2)^2}{25} + \frac{(x-6)^2}{16} = 1$

C. $\frac{(x-6)^2}{25} + \frac{(y+2)^2}{16} = 1$

D. $\frac{(x-6)^2}{16} + \frac{(y+2)^2}{9} = 1$

38. What is the radius of the circle $x^2 + y^2 + 12x - 14y - 36 = 0$?

- A. 8
B. 11
C. 14
D. 9

39. Identify the conic $5x^2 + 7y^2 - 8x + 2y + 3 = 0$.

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

40. Find the 43rd term of the arithmetic sequence 7, 13, 19...

- A. 230
B. 259
C. 271
D. 327

41. Evaluate $\sum_{i=3}^7 (2i - 7)$

- A. 15
- B. 24
- C. 12
- D. 17

42. Find the sum of the first 25 terms of the arithmetic sequence 87, 81, 75...

- A. 380
- B. 356
- C. 394
- D. 375

43. Find the eighth term of the geometric sequence 6, 42, 294...

- A. 4670856
- B. 4941258
- C. 4868896
- D. 4270596

44. Find the sum of the first seven terms of the geometric sequence having $a_1 = 15$ and $r = 6$.

- A. 839574
- B. 764893
- C. 839805
- D. 764736

45. A ball is dropped from a height of 16 feet and bounces $\frac{3}{4}$ of its height. How far will the ball travel before it comes to rest?

- A. 106 feet.
- B. 124 feet
- C. 118 feet
- D. 112 feet

46. Expand $(2x - y)^4$.

- A. $16x^4 - 32x^3y + 24x^2y^2 - 8xy^3 + y^4$
- B. $16x^4 - 32x^3y + 24x^2y^2 - 9xy^3 + y^4$
- C. $16x^4 - 42x^3y + 24x^2y^2 - 8xy^3 + y^4$
- D. $16x^4 - 32x^3y + 28x^2y^2 - 8xy^3 + y^4$

47. Find the third term of $(3x - 2y)^5$.

- A. $-1080x^2y^3$
- B. $1080x^3y^2$
- C. $-1080x^3y^2$
- D. $1080x^2y^3$

48. If a bag contains 8 yellow, 4 white, and 6 blue marbles, how many samples of four can be drawn if the color does not matter?
- A. 3320
 - B. 3060
 - C. 2436
 - D. 2594
49. Two marbles are drawn at random from a box containing 7 red, 3 green, and 6 yellow marbles. What is the probability that both of the marbles are yellow?
- A. $\frac{2}{7}$
 - B. $\frac{1}{3}$
 - C. $\frac{1}{8}$
 - D. $\frac{3}{8}$
50. A bag contains 8 red, 5 yellow, and 10 green marbles. If a marble is drawn at random, what are the odds in favor of not picking a green marble?
- A. 10 to 13
 - B. 2 to 1
 - C. 8 to 15
 - D. 13 to 10

