

**BROWNSVILLE CITY MATH MEET
JAMES PACE HIGH SCHOOL**

MAY 8, 2008



ALGEBRA I (HIGH SCHOOL)

NAME _____

SCHOOL _____

DO NOT TURN THE PAGE UNTIL INSTRUCTED TO DO SO

ALGEBRA I TEST

- Solve the system $x = (y - 4)^2$ and $x + 5y = 34$ for y .
 - $-3, -6$
 - $-6, 3$
 - $3, 6$
 - $-3, 6$
- Given the circle $(x - 6)^2 + (y + 4)^2 = 64$, find the center and radius.
 - $(-6, 4); r = 8$
 - $(6, -4); r = 8$
 - $(-6, -4); r = 8$
 - $(6, 4); r = 8$
- Given $f(x) = 2x^2 + x - 8$ and $g(x) = 3x^2 - 5x - 1$ find $(g \circ f)(2)$ is
 - 8
 - 12
 - 1
 - 7
- Evaluate the determinant $\begin{vmatrix} -8 & 9 \\ -3 & 4 \end{vmatrix}$
 - 12
 - 2
 - 4
 - 5
- Evaluate $\frac{9 + 3(-4) + 7}{5(7 - 3)}$.
 - $\frac{1}{5}$
 - $\frac{1}{3}$
 - $\frac{2}{3}$
 - $\frac{3}{4}$
- List all the natural numbers of B given $B = \{5, -8, \sqrt{9}, 0, 8.3, \frac{2}{5}, 2, -\frac{3}{7}, \sqrt{10}\}$
 - $5, -8, \sqrt{9}, 0, 2$
 - $5, \sqrt{9}, 0, 2$
 - $5, 0, 2$
 - $5, \sqrt{9}, 2$

7. Write a numerical expression for 10 less than five times the sum of a number and -2 then simplify.

- A. $5x + (-2) - 10$; $5x - 17$
- B. $10 - 5x + (-2)$; $-5x + 8$
- C. $5(x + (-2)) - 10$; $5x - 20$
- D. $10 - 5(x + (-2))$; $-5x + 20$

8. Simplify: $-6(3y + 4) - (2y - 1) + 3y - 7$.

- A. $7y - 15$
- B. $-17y - 30$
- C. $8y + 14$
- D. $-10y - 25$

9. Solve: $12r - 15 - 8r - 2.7 = -0.2r + 11.3 - 1.6r$

- A. 5
- B. -3
- C. 6
- D. -2

10. Solve: $\frac{1}{4}x + \left(x - \frac{1}{3}\right) = \frac{1}{6}(3x - 11)$

- A. 9
- B. -7
- C. 4
- D. -2

11. If 8 is added to the largest of three consecutive even integers the result is eighteen less than the sum of the two smaller integers. Find the largest integer.

- A. 48
- B. 32
- C. 24
- D. 38

12. If the $m\angle A$ is $(8x - 12)^\circ$ and the $m\angle B$ is $(3x + 14)^\circ$, find the measure of angle A if the angles are complementary.

- A. 52°
- B. 65°
- C. 39°
- D. 48°

13. Solve: $\frac{3}{2}(x+2) - \frac{1}{3}(3-x) < x - \frac{1}{2}$. Write the answer in interval notation.
- A. $(-\infty, -3]$
B. $(-\infty, 3]$
C. $(-\infty, -3)$
D. $(-3, \infty)$
14. Find the slope of a line perpendicular to the line passing through $(-8, 5)$ and $(6, -3)$.
- A. $-\frac{4}{7}$
B. $-\frac{7}{4}$
C. $\frac{4}{7}$
D. $\frac{7}{4}$
15. Find the equation of the line that is parallel to $6x - 7y + 37 = 0$ and passes through the point $(-2, 4)$.
- A. $7x - 6y = 10$
B. $7x - 6y = -38$
C. $6x - 7y = -40$
D. $7x + 6y = 10$
16. Which equation has a x -intercept of 4?
- A. $7x + 4y - 28 = 0$
B. $3x + 5y - 20 = 0$
C. $y - 4 = 0$
D. $2x + 3y + 8 = 0$
17. Simplify $3c^4(5c-2)(2c+1)$
- A. $30c^5 + 3c^4 - 6c^3$
B. $30c^6 + 14c^5 - 6c^4$
C. $30c^6 + 3c^5 - 6c^4$
D. $30c^5 - 7c^4 - 6c^3$
18. Subtract the sum of $6a^3 - 3a^2 + 2a$ and $4a^2 - 7a - 3$ from the sum of $7a^3 - 4a^2 + 7$ and $2a^2 - 3a - 5$.
- A. $2a^3 - 10a^2 + 7a + 6$
B. $a^3 - 3a^2 + 2a + 5$
C. $a^3 - 12a^2 - 3a + 7$
D. $-3a^3 + 4a^2 - 2a - 6$

19. Simplify $\left(\frac{r^3 s^{-2} t}{r s^2 t^3}\right)^2 \left(\frac{r^{-1} t^2}{r^{-2} s t^3}\right)^{-2}$

A. $r^2 s^3 t$

B. $\frac{r^2}{s^6 t^2}$

C. $\frac{r^3 s^2}{t^3}$

D. $\frac{r^2}{s^4 t^2}$

20. What is the remainder of $(20x^3 - 47x^2 + 72x - 40) \div (4x - 3)$?

A. -3

B. 5

C. -4

D. 6

21. Which of the following is a factor of $15x^4 + 4x^3 - 4x^2$?

A. $5x - 2$

B. $3x + 5$

C. $5x - 3$

D. $3x - 1$

22. Which of the following is a factor of $12m^4 - 11m^3n - 15m^2n^2$?

A. $3m + 2n$

B. $4m + 5n$

C. $6m - 5n$

D. $4m + 3n$

23. The product of the roots for $3k^2 - 11k + 22 = 4(k^2 - 2k + 1)$ is

A. 10

B. -18

C. -12

D. 16

24. Find the slope of the line passing through the points $(-10, 3)$ and $(2, -1)$.

A. $-\frac{1}{3}$

B. $-\frac{3}{4}$

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

D. $\frac{1}{2}$

25. Perform the indicated operation: $\frac{a^2 + 3a - 28}{a^2 + 12a + 35} \div \frac{a^2 - 10a + 24}{a^2 + 13a + 40}$

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

26. Perform the indicated operation: $\frac{9y^2 - 6y - 8}{9y^2 - 16} * \frac{6y^2 + 11y + 4}{10y^2 + 11y + 3}$

- A. $\frac{3y-4}{2y+1}$
 B. $\frac{3y+2}{5y+3}$
 C. $\frac{3y+4}{3y-4}$
 D. $\frac{2y+1}{5y+3}$

27. Simplify: $\frac{3r}{6r^2 + r - 1} + \frac{2r}{2r^2 + 5r + 2} - \frac{3r+1}{3r^2 + 5r - 2}$

- A. $\frac{4r^2 - r - 3}{(3r-1)(2r+1)(r+2)}$
 B. $\frac{3r^2 - r - 1}{(3r-1)(2r+1)(r+2)}$
 C. $\frac{2r^2 - r - 3}{(3r-1)(2r+1)(r+2)}$
 D. $\frac{3r^2 - 2r - 1}{(3r-1)(2r+1)(r+2)}$

28. A cold water faucet can fill a sink in 18 min. and a hot water faucet can fill it in 22 min. The drain can empty the sink in 28 min. If both faucets are on and the drain is open, how long will it take to fill the sink?

- A. 15.3 min
 B. 14.5 min
 C. 16.4 min
 D. 13.2 min

29. Solve: $\frac{x+4}{x^2+4x+3} + \frac{x-2}{x^2+3x+2} = \frac{2x+1}{x^2+5x+6}$

- A. $\frac{5}{8}$
- B. $\frac{11}{6}$
- C. $-\frac{1}{4}$
- D. $-\frac{3}{2}$

30. Simplify: $\frac{\frac{-6}{x+3} + 4}{\frac{6}{x+3} - 4}$

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

31. Write $\frac{y^2 - 12y + 32}{y^2 - 2y - 48}$ in lowest terms.

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

32. Find the slope of the line which is perpendicular to the line $9x - 4y + 11 = 0$.

- A. $-\frac{4}{9}$
- B. $\frac{9}{4}$
- C. $-\frac{9}{4}$
- D. $\frac{4}{9}$

33. The collision impact of an automobile varies jointly as its mass and the square of its speed. Suppose a 3200-lb car traveling 70 mph has a collision impact of 8.6. What is the collision impact of the same car at 40 mph?

- A. 3.5
- B. 4.2
- C. 2.8
- D. 5.3

34. Solve the system of equations for y : $4x - 7y = 5$ and $3x - 5y = 3$.

- A. 6
- B. -3
- C. -4
- D. 1

35. Solve the system of equations for z . $4x - 2y + 3z = -3$

$$2x + y - z = 8$$

$$3x + 3y + 2z = 3$$

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

36. A bill for eight hamburgers and five soft drinks was \$41.10. A second order for three hamburgers and four soft drinks was \$19.45. What was the difference in cost between the hamburger and the soft drink?

- A. \$1.95
- B. \$2.50
- C. \$2.05
- D. \$1.90

37. Give the solution set of the compound inequality in interval notation. $5x + 3 \geq 3x - 11$ and $7x - 2 < 4x + 7$

- A. $[-7, 3)$
- B. $(-7, 3]$
- C. $[-7, 3]$
- D. $(-7, 3)$

38. Express in simplest interval notation: $[-4, 6) \cap (-1, 8)$

- A. $(-1, 6]$
- B. $[-1, 6]$
- C. $[-1, 6)$
- D. $(-1, 6)$

39. Solve the inequality: $|-4x + 3| < 9$

- A. $\{x \mid x < \frac{-3}{2} \text{ or } x > 3\}$
- B. $\{x \mid \frac{-3}{2} < x < 3\}$
- C. $\{x \mid -3 < x < \frac{3}{2}\}$
- D. $\{x \mid x < -3 \text{ or } x > \frac{2}{3}\}$

40. Express in simplified form: $\sqrt[5]{64x^8y^{12}z^3}$

A. $2xy^2\sqrt[5]{2x^3y^2z^3}$

B. $2x^2y\sqrt[5]{2x^2y^2z^3}$

C. $2x^4y^2\sqrt[5]{2xy^2z^3}$

D. $2xy^2\sqrt[5]{2x^2y^2z^3}$

41. Solve $\sqrt{3x+10} = x$

A. $\{-2\}$

B. $\{-5, 2\}$

C. $\{-2, 5\}$

D. $\{5\}$

42. Simplify $(3\sqrt{28} - 3\sqrt{14})^2$

A. $252 - 378\sqrt{2}$

B. $378 - 252\sqrt{2}$

C. $252 + 378\sqrt{2}$

D. $378 + 252\sqrt{2}$

43. Solve $(x+3)^2 = 50$

A. $\{-5 \pm 3\sqrt{2}\}$

B. $\{3 \pm 5\sqrt{2}\}$

C. $\{-3 \pm 5\sqrt{2}\}$

D. $\{5 \pm 3\sqrt{2}\}$

44. Solve $5x^2 - 3x = -5$

A. $\left\{ \frac{3}{10} \pm \frac{\sqrt{51}}{10}i \right\}$

B. $\left\{ -\frac{3}{10} \pm \frac{\sqrt{51}}{10}i \right\}$

C. $\left\{ \frac{3}{10} \pm \frac{\sqrt{91}}{10}i \right\}$

D. $\left\{ -\frac{3}{10} \pm \frac{\sqrt{91}}{10}i \right\}$

45. If $24x^2 - 5 = 26x$, then what would be the value of $2x$?

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

46. Solve $\frac{y+5}{y+2} \leq 3$ and give the solution in interval notation form.

- A. $(-2, -\frac{1}{2}]$
- B. $(-\infty, -2) \cup [-\frac{1}{2}, \infty)$
- C. $(-\infty, -2] \cup [-\frac{1}{2}, \infty)$
- D. $(-\infty, -2) \cup (-\frac{1}{2}, \infty)$

47. Solve $6y^2 - y > 35$ and give the solution in interval notation form.

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

48. Solve $4^{5x} = 102$ to three decimal places for x .

- A. 0.667
- B. 0.683
- C. 0.685
- D. 0.619

49. Solve $\log_4(3t+8) + \log_4 t = \log_4 35$

- A. $\frac{5}{3}$
- B. $\frac{3}{7}$
- C. $\frac{3}{5}$
- D. $\frac{7}{3}$

50. Identify the conic and its center represented by the equation $\frac{(x+6)^2}{25} + \frac{(y-4)^2}{36} = 1$

- A. Ellipse; $(6, -4)$
- B. Hyperbola; $(6, -4)$
- C. Ellipse; $(-6, 4)$
- D. Hyperbola; $(-6, 4)$

