

MATH 21

NAME _____

1. Simplify $\frac{x^2 - 64}{x^2 + 8x}$.

FINAL EXAM
NUMBER _____

STUDENT _____

a) $\frac{x + 8}{x}$

DECEMBER, 2005
TOR _____INSTRUC-
TOR _____

b) $\frac{x - 8}{x}$

c) $-\frac{8}{x}$

FORM A
NUMBER _____

SECTION _____

d) $\frac{8}{x}$

e) $\frac{x}{x + 8}$

This examination will be machine processed by the University Testing Service. Use only a number 2 pencil on your answer sheet. On your answer sheet identify your name, this course (Math 21) and the date. Code and blacken the corresponding circles on your answer sheet for your student I.D. number and class section number. Code in your test form.

There are 30 multiple choice questions each worth five points. For each problem **five** possible answers are given, only one of which is correct. You should solve the problem, note the letter of the answer that you wish to give and **blacken** the corresponding space on the **answer sheet**. Mark only one choice; darken the circle completely (you should not be able to see the letter after you have darkened the circle). Check frequently to be sure the problem number on the test sheet is the same as the problem number of the answer sheet.

THE USE OF A CALCULATOR, CELL PHONE, OR ANY OTHER ELECTRONIC DEVICE IS NOT PERMITTED DURING THIS EXAMINATION.

CHECK THE EXAMINATION BOOKLET BEFORE YOU START. THERE SHOULD BE 30 PROBLEMS ON 16 PAGES (INCLUDING THIS ONE).

2. Simplify $\frac{2x + 10}{9y} \cdot \frac{x^2 + 5}{x^2 + 10x + 25}$.

a) $\frac{x^2 + 5}{9xy + 45y}$

b) $\frac{2x - 10}{9xy - 45y}$

c) $\frac{2x^2 + 10}{9xy + 45y}$

d) $\frac{2x^2 + 10}{xy + 5y}$

e) $\frac{10}{45y}$

3. Simplify $\frac{4x}{x - 3} + \frac{5}{x}$.

a) $\frac{4x^2 + 5x + 15}{x(x - 3)}$

b) $\frac{9x - 15}{x(x - 3)}$

c) $\frac{4x^2 + 5x + 15}{x^2 - 4x}$

d) $\frac{4x^2 + 5x - 15}{x(x - 3)}$

e) $\frac{9x}{2x - 3}$

4. Simplify $\frac{\frac{5}{x} - \frac{8}{y}}{\frac{11}{y} - \frac{2}{xy}}$.

a) $\frac{5x - 8y}{11 - 2x}$

b) $\frac{5x - 8y}{11x - 2}$

c) $\frac{5y - 8x}{11x - 2}$

d) $\frac{-3}{xy}$

e) $\frac{-xy}{9}$

5. Solve $\frac{3x-5}{3} = \frac{4}{x}$.

- a) $\left\{\frac{7}{3}, 3\right\}$
- b) $\left\{\frac{4}{3}, -3\right\}$
- c) $\left\{-\frac{7}{3}, -3\right\}$
- d) $\left\{-\frac{4}{3}, 3\right\}$
- e) $\left\{\frac{5}{3}, 4\right\}$

6. Solve the equation $-\frac{2}{x-6} = \frac{5}{y-1}$ for the variable y .

- a) $y = -\frac{5}{2}x + 16$
- b) $y = \frac{2}{5}x - 16$
- c) $y = \frac{5}{2}x + 16$
- d) $y = x - 6$
- e) $y = 5x - 30$

7. Simplify $\left(\frac{16x^{-3}y^{-2}}{8x^8y^4}\right)^{-1}$.

- a) $\frac{2}{x^{11}y^6}$
- b) $2x^{11}y^6$
- c) $\frac{x^{11}y^6}{2}$
- d) $2x^5y^2$
- e) $\frac{24}{x^{11}y^2}$

8. Evaluate $\sqrt[3]{\frac{64}{125}}$.

- a) $\frac{4}{5}$
- b) $\frac{2}{3}$
- c) $\frac{1}{61}$
- d) $\frac{5}{6}$
- e) $\left(\frac{125}{64}\right)^3$

9. Simplify $9\sqrt{75} - 3\sqrt{3} - 3\sqrt{75}$.

- a) $22\sqrt{3}$
- b) $34\sqrt{3}$
- c) $27\sqrt{3}$
- d) $25\sqrt{3}$
- e) $3\sqrt{75}$

10. Simplify $\frac{\sqrt[3]{50xy}}{\sqrt[3]{2x^2y^5}}$.

- a) $\frac{25\sqrt[3]{xy}}{xy^2}$
- b) $\frac{\sqrt[3]{25x^2y^2}}{xy^2}$
- c) $\frac{5\sqrt[3]{x^2y^2}}{xy^2}$
- d) $\frac{\sqrt[3]{25xy}}{y}$
- e) $\frac{5}{xy^2}$

11. Simplify $(\sqrt{2}+6)(\sqrt{2}-6)$.

- a) $2\sqrt{2} - 36$
- b) 38
- c) $2\sqrt{2} + 36$
- d) -4
- e) -34

12. Solve $2\sqrt{x} + 3 = x$.

- a) $x = 9, x = -9$
- b) $x = 9$
- c) $x = 9, x = 1$
- d) $x = -3$
- e) $x = 2, x = 3$

13. Simplify $\left(\frac{x^6}{y^7}\right)^{-\frac{1}{6}}$.
- $\frac{(y)^{\frac{7}{6}}}{x}$
 - $\frac{(y)^7}{x}$
 - $\frac{(y)^{\frac{6}{7}}}{x}$
 - $\frac{(x)^{\frac{7}{6}}}{y}$
 - $\frac{y}{(x)^6}$
14. Write $\frac{-4 + 18i}{-1 + i}$ in standard form.
- $-11 + 7i$
 - $11 - 7i$
 - $-7 + 11i$
 - $22 - 14i$
 - $4 - 18i$
15. One of the factors of $x^2 + 2kx - 35k^2 = 0$ is
- $x + 2$.
 - $x - 35k$.
 - $x + 7k$.
 - $x + 5k$.
 - $x + 2k$.
16. By the method of completing the square, the quadratic equation $x^2 + 8x - 4 = 0$ can be rewritten as
- $(x - 4)^2 = 20$.
 - $(x + 8)^2 = 4$.
 - $(x + 4)^2 = 20$.
 - $(x - 8)^2 = 4$.
 - $(x - 4)^2 = 64$.
17. Solve $x^2 + 10x - 10 = 0$.
- $5 \pm \sqrt{35}$
 - $-4 \pm \sqrt{35}$
 - $0, 5 - \sqrt{35}$
 - $-7 \pm \sqrt{35}$
 - $-5 \pm \sqrt{35}$
18. Larry drove 500 miles in 5 hours more than it took Terrell to drive 300 miles. Terrell drove at an average rate of 10 miles per hour faster than Larry. How fast did Larry travel?
- 52 mph
 - 45 mph
 - 50 mph
 - 40 mph
 - 49 mph
19. Solve the inequality $x(x + 2)(x - 4) \leq 0$.
- $(-\infty, -4] \cup [2, \infty)$
 - $(-\infty, 2] \cup [4, \infty)$
 - $(-\infty, -2] \cup [0, 4]$
 - $(-2, 4)$
 - $(-\infty, \infty)$
20. Solve the inequality $\frac{x + 18}{x - 5} > -5$.
- $\left(-\infty, -\frac{7}{6}\right) \cup \left(\frac{7}{6}, \infty\right)$
 - $\left(-\infty, \frac{7}{6}\right) \cup (5, \infty)$
 - $(-\infty, -5) \cup (5, \infty)$
 - $(-5, 18)$
 - $(-\infty, \infty)$
21. Find the vertex of the parabola $y = (x + 2)^2 - 3$.
- $(2, -3)$
 - $(4, -3)$
 - $(-2, -3)$
 - $\left(\frac{2}{3}, 0\right)$
 - $(0, 1)$
22. Find the center of the circle $x^2 + y^2 - 12x + 30y = 0$.
- $(6, -15)$
 - $(15, 6)$
 - $(15, -6)$
 - $(-12, 30)$
 - $(0, 0)$

23. Write the equation of the circle with center at $(-8, 10)$ and the length of a radius $r = 10$.
- $x^2 + y^2 - 16x + 20y + 64 = 0$
 - $x^2 + y^2 - 16x - 20y + 64 = 0$
 - $x^2 + y^2 + 8x - 10y + 64 = 0$
 - $x^2 + y^2 + 10x + 8y + 64 = 0$
 - $x^2 + y^2 + 16x - 20y + 64 = 0$
24. The graph of the equation $144x^2 - y^2 = 144$ is
- a circle.
 - a hyperbola.
 - a parabola.
 - an ellipse.
 - a straight line.
25. Find the intercepts for the equation $25x^2 - 4y^2 = 4$.
- $\left(\frac{2}{5}, 0\right), \left(-\frac{2}{5}, 0\right)$
 - $\left(0, \frac{5}{2}\right), \left(0, -\frac{5}{2}\right)$
 - $\left(\frac{5}{2}, 0\right), \left(-\frac{5}{2}, 0\right)$
 - $(2, 0), (-2, 0)$
 - $(25, 0), (0, -4)$
26. Solve the system $\begin{cases} 4x + y = 0 \\ x - 6y = -25 \end{cases}$.
- $(-1, 4)$
 - $(4, -1)$
 - $\left(\frac{25}{23}, -\frac{100}{23}\right)$
 - infinitely many solutions
 - no solutions
27. Cindy has 30 coins, consisting of dimes and quarters, that total \$5.10. How many quarters does she have?
- 20
 - 18
 - 15
 - 14
 - 13
28. When (x, y) describes a point in the solution set of the system $\begin{cases} 8x + 9y = 30 \\ 4x + y = -6 \end{cases}$, then
- $y = -3$.
 - $y = 6$.
 - $y = 3$.
 - y has infinitely many values.
 - y has no real value.
29. A small-town library buys a total of 55 books that cost \$960. Some of the books cost \$13 each, and the remainder cost \$20 per book. How many \$20 books did they buy?
- 19
 - 20
 - 25
 - 35
 - 36
30. Solve the system $\begin{cases} x - y = 6 \\ x^2 - y^2 = 60 \end{cases}$.
- $(8, 2)$
 - $(-8, 2)$
 - $(8, -2)$
 - The system is dependent.
 - The system is inconsistent.