

MATH 21

NAME _____

EXAM I

STUDENT

NUMBER _____

OCTOBER 10, 2005

INSTRUC-

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FORM A

SECTION

NUMBER _____

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 20 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 20 PROBLEMS ON 11 PAGES (INCLUDING THIS ONE).

1. Simplify $\frac{a^2 + 5a + 6}{a^2 - 5a - 14}$.

- a) $a + 2$
- b) $\frac{a + 3}{a - 2}$
- c) $\frac{a + 3}{a - 7}$
- d) $\frac{a + 3}{a + 2}$
- e) $\frac{1}{a + 2}$

2. Simplify $\frac{m^2 - 49}{7 - m}$.

- a) $m - 8$
- b) $7 - m$
- c) $-m - 8$
- d) $-m - 7$
- e) $m + 7$

3. Simplify $\frac{3a^4b^4}{4a^3b^3} \cdot \frac{44a^5}{39a^3b^4}$.

- a) $\frac{11a^3}{b^4}$
- b) $\frac{11a^2}{13b^4}$
- c) $\frac{11a^3}{13b^3}$
- d) $\frac{13a^3}{11b^3}$
- e) $\frac{11b^3}{11a^3}$

4. Simplify $\frac{2x + 14}{3y} \div \frac{x^2 + 14x + 49}{x^2 + 7}$.

- a) $\frac{2x^2 + 14}{xy + 7y}$
- b) $\frac{2x - 14}{3xy - 21y}$
- c) $\frac{x^2 + 7}{3xy + 21y}$
- d) $\frac{2x^2 + 14}{3xy + 21y}$
- e) $\frac{2x^2 + 14}{xy - 7y}$

5. Simplify $\frac{6x}{x-3} + \frac{7}{x}$.
- $\frac{6x^2 + 7x + 21}{x^2 - 4x}$
 - $\frac{6x^2 + 7x + 21}{x(x-3)}$
 - $\frac{13x - 21}{x(x-3)}$
 - $\frac{6x^2 + 7x - 21}{x(x-3)}$
 - $\frac{6x + 7}{x(x-3)}$
6. Subtract and simplify $\frac{6x}{x-5} - 5$.
- $\frac{x-25}{x-5}$
 - $\frac{x-25}{x+5}$
 - $\frac{x+25}{x-5}$
 - $\frac{11x+25}{x-5}$
 - $\frac{6x-5}{x-5}$
7. Simplify $\frac{n}{n-9} + \frac{n+9}{n+5} + \frac{20n+81}{n^2-4n-45}$.
- $\frac{n(2n+25)}{(n-9)(n+5)}$
 - $\frac{2n(n+25)}{(n+9)(n-5)}$
 - $\frac{n(2n+25)}{(n+9)(n-5)}$
 - $\frac{22n+90}{n^2-4n-45}$
 - $\frac{n(n+9)}{(n+5)(n-9)}$
8. Simplify $\frac{\frac{7}{x} - \frac{14}{x+7}}{\frac{2}{x^2+7x} + \frac{2}{x}}$.
- $-\frac{7(3x+7)}{2(x+8)}$
 - $-\frac{2(3x-7)}{7(x+8)}$
 - $-\frac{7(3x-7)}{2(x+8)}$
 - $\frac{-21}{x^2+7x}$
 - $\frac{2(x+8)}{7(3x+7)}$
9. Solve $\frac{15-n}{n} = 1 + \frac{3}{n}$.
- $n = 6$
 - $n = 7$
 - $n = 11$
 - $n = 4$
 - $n = 10$
10. Find the sum of the solutions for the equation $\frac{x}{x+5} - 2 = \frac{15}{x-15}$.
- 5
 - 15
 - 2
 - 10
 - 10
11. Solve $\frac{5y-65}{(3y+5)(5y-2)} - \frac{4}{3y+5} = \frac{3}{5y-2}$.
- $y = 0$
 - $y = 3$
 - $y = -3$
 - $y = -4$
 - $y = 5$
12. It takes Amy twice as long to deliver papers as it does Nancy. How long, in minutes, would it take each girl to deliver the papers by herself if they can deliver the papers together in 60 minutes?
- 90 minutes for Nancy and 180 minutes for Amy
 - 60 minutes for Nancy and 120 minutes for Amy
 - 120 minutes for Nancy and 60 minutes for Amy
 - 30 minutes for Nancy and 60 minutes for Amy
 - 20 minutes for Nancy and 40 minutes for Amy
13. Simplify $(2xy^{-4})(4x^{-5}y^9)$.
- $8x^4y^5$
 - $\frac{8y^5}{x^4}$
 - $\frac{x^4}{8y^5}$
 - $\frac{x^5}{8y^4}$
 - $\frac{1}{8x^4y^5}$

14. Simplify $\left(\frac{6x^{-1}y^{-5}}{2x^{-3}y^{-2}}\right)^{-1}$.

a) $\frac{y^3}{3x^2}$

b) $\frac{3x^2}{y^3}$

c) $3x^2y^3$

d) $\frac{3}{x^2y^3}$

e) $\frac{1}{3x^2y^3}$

15. Simplify $-\frac{10\sqrt{12}}{15\sqrt{21}}$.

a) $\frac{21}{15}\sqrt{12}$

b) $-\frac{4}{21}\sqrt{7}$

c) $-\frac{\sqrt{21}}{21}$

d) $4\sqrt{7}$

e) $-\frac{120}{315}$

16. Simplify $\frac{\sqrt[3]{18}}{\sqrt[3]{6}}$.

a) $6\sqrt[3]{18}$

b) 3

c) $\sqrt[3]{12}$

d) $\sqrt[3]{3}$

e) $\frac{1}{\sqrt[3]{3}}$

17. Simplify $\sqrt{\frac{20y^3}{9x}}$.

a) $\frac{2y\sqrt{5xy}}{3x}$

b) $\frac{2y\sqrt{5xy}}{x}$

c) $\frac{2\sqrt{5xy}}{3x}$

d) $\frac{\sqrt{20y^2}}{3}$

e) $\frac{2y^2\sqrt{5xy}}{3x}$

18. Simplify $3\sqrt{18x} + 8\sqrt{32x} - 6\sqrt{50x}$.

a) $2\sqrt{x}$

b) $2\sqrt{11x}$

c) $11\sqrt{x}$

d) $11\sqrt{2x}$

e) $5\sqrt{2x}$

19. Multiply and simplify $(\sqrt{19} + 2)(\sqrt{19} - 2)$.

a) 17

b) 23

c) 15

d) $2\sqrt{19} - 2$

e) $2\sqrt{19} - 4$

20. Rationalize the denominator and simplify $\frac{\sqrt{b}}{\sqrt{b} - 10}$.

a) $\frac{10\sqrt{b}}{b - 100}$

b) \sqrt{b}

c) $\frac{b + 10\sqrt{b}}{b^2 - 100}$

d) $\frac{11b}{b - 100}$

e) $\frac{b + 10\sqrt{b}}{b - 100}$