BARUCH COLLEGE
MATHEMATICS 0120

039A Time: 2 Hours

NAME:_____

PART I: Do all your work in the back of the blue booklet. Write your answer on the line to the right of each problem. No partial credit allowed. 3 points each.

1. What is the greatest common factor of $81x^7y^3 - 63x^4y^5$?

   a) $9x^7y^5$ b) $9x^{11}y^8$ c) $9x^4y^3$ d) $5103x^{11}y^8$

   e) $9x^3y^2$ _____

2. Factor $21x^2 + 37x - 10$. One of the factors is:

   a) $3x - 5$ b) $21x - 5$ c) $3x + 2$ d) $3x + 5$ e) $3x - 2$ _____

3. Factor $x^2 - 49x$ and $x^2 - 81$.
   Which of the following is NOT a factor of either polynomial?

   a) x b) $x - 9$ c) $x - 49$ d) $x + 9$ e) $x - 7$ _____

4. Factor $x^2 + x - 2$ and $x^2 - 2x - 3$.
   Which of the following is NOT a factor of either polynomial?

   a) $x + 2$ b) $x - 3$ c) $x + 3$ d) $x - 1$ e) $x + 1$ _____

5. Completely factor: $3t^6 - 30t^5 + 63t^4$.
   Which of the following is NOT a factor?

   a) $t - 3$ b) $t - 7$ c) $t + 7$ d) 3 e) t^4 _____

6. Solve $35x^2 - 2 = 3x$. The solutions are:

   a) 2/7 and -1/5 b) 1/7 c) -2/7 and 1/5

   d) 2/5 and -1/7 e) -2/5 and 1/7 _____

7. Given the function $f(x) = 7x^2 - 9x + 3$, find $f(-8)$.

   a) -373 b) 3211 c) 379 d) -517 e) 523 _____

8. Find the least common denominator for: $\frac{1}{t^2 + 9t - 22}$ and $\frac{1}{t^2 - 4}$.

   a) $(t - 2)(t + 2)(t + 11)$ b) $(t - 2)^2(t + 2)(t + 11)$

   c) $(t - 2)$ d) 1

   e) $(t + 2)(t + 11)$ _____

Continued on Page 2

9. Multiply and write your answer in lowest terms: $\frac{m^2 + 6m + 5}{m^2 + 3m + 2} \cdot \frac{m^2 - 4}{m^2 - 25}$.

a) $\frac{2}{5}$

b) $\frac{(m + 5)(m + 5)(m - 5)}{(m + 2)(m + 2)(m - 2)}$

c) $\frac{4}{5}$

d) $\frac{4(6m + 5)}{25(3m + 2)}$

e) $\frac{m - 2}{m - 5}$

_____

10. Subtract and write your answer in lowest terms: $\frac{8x^6}{y^4} - \frac{7}{8x^3}$.

a) $\frac{x^3 - 7}{y^4 - 1}$ b) $\frac{8x^6 - 7}{y^4 - 8x^3}$ c) $64x^9 - 7y^4$ d) $\frac{64x^9 - 7y^4}{8x^3y^4}$

e) $\frac{x^3 - 7y^4}{y^4}$

_____

11. For what values of x is $\frac{x - 11}{x^2 - 4x - 5}$ undefined?

a) 5 b) 11 c) -1 or 5 d) -4 e) -11

_____

12. Solve: $\frac{4}{7r} - \frac{2}{5r} = \frac{19}{35}$.

a) 19/35 b) -6/19 c) 35/19 d) 6/19 e) 19/6

_____

13. Divide and write your answer in lowest terms: $\frac{5n + 10}{2n + 10} \div \frac{n + 50}{10n + 50}$.

a) $\frac{50n}{n + 5}$ b) $\frac{(5n + 1)(n + 50)}{(2n + 1)(n + 5)}$ c) 25

d) $\frac{25(n + 2)}{n + 50}$ e) $\frac{(n + 2)(n + 50)}{4(n + 5)(n + 5)}$

_____

14. Add and write your answer in lowest terms: $\frac{4}{28r - 35} + \frac{6r + 5}{12r - 15}$.

a) $42r + 47$

b) $\frac{6r + 9}{40r - 50}$

c) $\frac{42r + 47}{21(4r - 5)}$

d) $168r^2 - 22r - 235$

e) $\frac{42r + 47}{21}$

_____

Continued on Page 3

15. Simplify the complex fraction: $\dfrac{7 + \frac{6}{x}}{2 - \frac{7}{y}}$.

a) $\dfrac{7xy + 6y}{2xy - 7x}$ b) $\dfrac{7 + 6y}{2 - 7x}$ c) $\dfrac{7y + 6}{2x - 7}$ d) $\dfrac{7 + 6x}{2 - 7y}$ e) $\dfrac{7x + 6}{2y - 7}$ _____

16. Find the equation of the horizontal straight line which passes through the point (4,6).

a) $y = 4$ b) $4x + 6y = 0$ c) $x = 6$ d) $3x = 12$

e) $3y = 18$ _____

17. Find the slope of the straight line which passes through (-1,3) and (5,-18).

a) -4/23 b) -5/2 c) -7/2 d) -15/4 e) -21/4 _____

18. Find the slope of $11x - 7y = 13$.

a) 7/11 b) -13/7 c) 11 d) -11 e) 11/7 _____

19. Find the equation of the straight line which passes through (4,8) and has a slope of 6.

a) $8x + 4y = 6$ b) $-6x + y = -16$ c) $6x + y = -16$

d) $-6x + y = 4$ e) $4x + 8y = 6$ _____

20. Find the slope of the straight line $y = -2 - 6x$.

a) 6 b) -2 c) -6 d) 2 e) 3 _____

21. Find the y-intercept of the straight line $13x + 5y = 3$.

a) 5 b) -13/5 c) 13 d) 3/5 e) 3/13 _____

22. The product of two integers is 91. The larger is 8 less than 3 times the smaller. Write down an equation that can be used to solve for the smaller integer, x.

a) $(8 - 3x)x = 91$ b) $x = 91(8 - 3x)$ c) $(3x - 8)x = 91$

d) $3x^2 - 8 = 91$ e) $3x - 8 = 91x$ _____

Continued on Page 4

23. The current in a river moves at the rate of 14 miles per hour. If x represents the speed of a boat in still water, write down an expression which represents the time it takes for the boat to travel 168 miles upstream.

a) $\frac{168}{x - 14}$ b) 12 c) $\frac{182}{x}$ d) $\frac{168}{x + 14}$ e) $\frac{168}{14 - x}$ _____

24. Luis invested a total of $71,300 in two accounts. One paid interest at the rate of 6% per year while the other paid interest at the rate of 5% per year. If the total interest that Luis received after one year was $3916, then find a system of equations that can be used to determine how much was invested at each rate by Luis.
(Use interest = principal x rate x time.)

a) $\begin{aligned} 6x + 5y &= 71{,}300 \\ x + y &= 3916 \end{aligned}$

b) $\begin{aligned} x + y &= 71{,}300 \\ 6x + 5y &= 3916 \end{aligned}$

c) $\begin{aligned} 0.06x + 0.05y &= 71{,}300 \\ x + y &= 3916 \end{aligned}$

d) $\begin{aligned} y &= 71{,}300 + x \\ 0.06x + 0.05y &= 3916 \end{aligned}$

e) $\begin{aligned} x + y &= 71{,}300 \\ 0.06x + 0.05y &= 3916 \end{aligned}$ _____

PART II: Do all your work in the front of the blue booklet. Leave your answer there. Partial credit is allowed.

25. Solve the system by using the addition method: (the method of elimination) $\begin{aligned} 2x + 9y &= -37 \\ 5x - 7y &= 55 \end{aligned}$
(7 points)

26. Solve by substitution: $\begin{aligned} 9x - 4y &= -70 \\ 6x + y &= -32 \end{aligned}$
(7 points)

27. Graph: $3x + 4y \leq 0$
(6 points)

28. Graph: $4x = 8$
(3 points)

29. Graph: $9x - 14y = 21$
(5 points)

HAND IN THIS EXAM WITH THE BLUE BOOKLET