SAMPLE

BARUCH COLLEGE
MATHEMATICS 0120

022A 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. Completely factor $168x^9 - 32x^8 - 8x^7$. One of the factors is:

   a) $7x + 1$ b) $8x^9$ c) $3x + 1$ d) $7x - 1$

   e) $21x^2 - 4x$ _____

2. Factor $x^2 - 2x - 3$ and $x^2 + 4x - 5$.
   Which of the following is NOT a factor of either polynomial?

   a) $x + 5$ b) $x - 3$ c) $x - 1$ d) $x - 5$ e) $x + 1$ _____

3. What is the greatest common factor of $18x^8y^2 - 48x^3y^5$?

   a) $864x^{11}y^7$ b) $6x^5y^3$ c) $6x^{11}y^7$ d) $6x^3y^2$ e) $6x^8y^5$ _____

4. Factor $21x^2 - 41x + 10$. One of the factors is:

   a) $7x + 2$ b) $7x - 2$ c) $7x - 10$ d) $3x + 5$ e) $21x - 1$ _____

5. Completely factor $4x^6 - 36x^4$. Which is NOT a factor?

   a) $x - 9$ b) x^4 c) $x - 3$ d) 4 e) $x + 3$ _____

6. Solve $10x^2 - 7 = -33x$. The solutions are:

   a) -13/5 b) -7/5 and 1/2 c) -7/2 and 1/5

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

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

   a) 93 b) 205 c) -89 d) 499 e) -201 _____

8. Find the least common denominator for: $\frac{1}{t^2 + 14t + 33}$ and $\frac{1}{t^2 - 9}$.

   a) $(t + 3)^2(t - 3)(t + 11)$ b) $(t + 3)(t - 3)(t + 11)$

   c) 1 d) $(t - 3)(t + 11)$

   e) $(t + 3)$ _____

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9. Multiply and write your answer in lowest terms: $\frac{y^2 - 10y - 11}{y^2 - 4y - 5} \cdot \frac{y^2 - 25}{y^2 - 121}$.

a) $\frac{25}{22}$

b) $\frac{25(-10y - 11)}{121(-4y - 5)}$

c) $\frac{5}{11}$

d) $\frac{(y - 11)(y - 11)(y + 11)}{(y - 5)(y - 5)(y + 5)}$

e) $\frac{y + 5}{y + 11}$

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10. Simplify (write in lowest terms; reduce): $\frac{33x - 55}{55 - 44x}$

a) $\frac{3}{4}$ b) $\frac{3x - 1}{1 - 4x}$ c) $\frac{-3}{4}$ d) $\frac{3x - 5}{5 - 4x}$ e) $\frac{33x - 1}{1 - 44x}$

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11. Solve: $\frac{6}{7y} - \frac{3}{4y} = \frac{5}{28}$.

a) 5/28 b) 3/5 c) -3/5 d) 28/5 e) 5/3

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12. Find the least common denominator for $\frac{1}{20u^{12}}$ and $\frac{1}{25u^{30}}$.

a) $100u^{60}$ b) $5u^{12}$ c) $100u^{12}$ d) $100u^{30}$ e) $500u^{30}$

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13. Divide and write your answer in lowest terms: $\frac{3x + 24}{8x + 24} \div \frac{x + 72}{24x + 72}$.

a) $\frac{(x + 8)(x + 72)}{64(x + 3)(x + 3)}$ b) $\frac{9(x + 8)}{x + 72}$ c) 9

d) $\frac{18x}{x + 3}$ e) $\frac{(3x + 1)(x + 72)}{(8x + 1)(x + 3)}$

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14. Add and write your answer in lowest terms: $\frac{8}{u^2 - 4u - 5} + \frac{3}{u^2 - 6u - 7}$.

a) $\frac{11u - 71}{(u + 1)^2(u - 5)(u - 7)}$

b) $11u^2 - 60u - 71$

c) $11u - 71$

d) $\frac{11u - 71}{(u + 1)(u - 5)(u - 7)}$

e) $\frac{11}{2u^2 - 10u - 12}$

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15. Simplify the complex fraction: $\dfrac{\dfrac{9n + 72}{9n^4}}{\dfrac{5n + 40}{n^8}}$

a) $\dfrac{8n^4}{5}$ b) $\dfrac{72n^5}{5n + 40}$ c) $\dfrac{5(n + 8)^2}{n^{12}}$ d) $\dfrac{n^4}{5}$

e) $\dfrac{n^4(n + 72)}{5n + 40}$ _____

16. Find the x-intercept of the straight line $3x + 11y = 2$.

a) 2/3 b) -3/11 c) 3 d) 11 e) 2/11 _____

17. Find the equation of the straight line passing through the origin whose slope is 3/13.

a) $13x + 3y = 0$ b) $3x = 13y$ c) $3x + 13y = 0$

d) $13x = 3y$ e) $3x + 13y = 1$ _____

18. Find the slope of $7x - 13y = 2$.

a) 7 b) -7 c) 7/13 d) -2/13 e) 13/7 _____

19. Find the slope of the straight line $y = 4 - 7x$.

a) 4 b) -7/4 c) 7 d) -7 e) -4 _____

20. Find the slope of the straight line which passes through (-12,17) and (7,-4).

a) 13/19 b) -21/19 c) 21/5 d) -13/5 e) -29/11 _____

21. Find the equation of the straight line which passes through (2,8) and has a slope of 6.

a) $8x + 2y = 6$ b) $6x + y = -4$ c) $-6x + y = -4$

d) $-6x + y = 6$ e) $2x + 8y = 6$ _____

22. The length of a rectangle is 2 more than its width. If the area of the rectangle is 80, write down an equation that can be used to find its width, x.

a) $x(x + 80) = 2$ b) $(x - 2)x = 80$

c) $x(x + 2) = 80$ d) $2(x + 2) + 2x = 80$

e) $(x - 80)x = 2$ _____

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23. The current in a river moves at the rate of 7 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 131 miles downstream.

a) $\frac{138}{x}$ b) $\frac{131}{x - 7}$ c) $\frac{131}{x + 7}$ d) $\frac{131}{7}$ e) $\frac{131}{7 - x}$ _____

24. Sofas cost 396 dollars to produce and 73 hours to make. Stoves take 61 hours to make and 265 dollars to produce. A total of 13607 dollars were spent and 2642 hours were used producing x sofas and y stoves. Find a system of equations which can be used to solve for x and y.

a) $73x + 396y = 2642$
$61x + 265y = 13607$

b) $73x + 396y = 13607$
$61x + 265y = 2642$

c) $61x + 73y = 2642$
$265x + 396y = 13607$

d) $73x + 61y = 2642$
$396x + 265y = 13607$

e) $73x + 265y = 2642$
$396x + 61y = 13607$

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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: $2x - 3y = 8$, $5x + 7y = -9$
(the method of elimination)
(7 points)

26. Solve by substitution: $9x + y = -49$
$5x + 8y = -57$
(7 points)

27. Graph: $14x + 9y = 21$
(5 points)

28. Graph: $4x = -12$
(3 points)

29. Graph: $2x + 5y \geq 0$
(6 points)

HAND IN THIS EXAM WITH THE BLUE BOOKLET