BRONX COMMUNITY COLLEGE
of the City University of New York

DEPARTMENT OF MATHEMATICS & COMPUTER SCIENCE

MATH 06 (JP)   Extra Credit (Due date: 12/14
Fall 2015   (DAY) 2 HOURS

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> **Directions: You** *must* **show all your work in the provided space for full credit. Simplify your answer whenever possible. Be certain to indicate your final answers clearly. Each problem is worth 5 points.**

Evaluate and simplify:

1. $\dfrac{-3}{x+5} - \dfrac{6}{x^2+2x-15}$
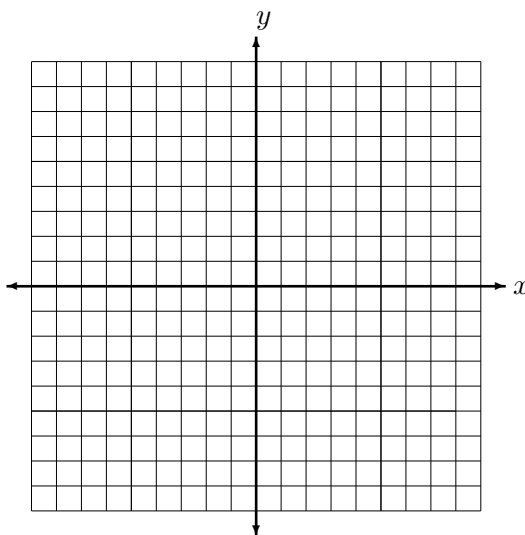
2. $\dfrac{2n-6}{n+4} \div \dfrac{n^2-n-6}{n^2-16}$

Solve:

3. $\sqrt{x-4} + 6 = x$

4. $\dfrac{2}{x-1} + \dfrac{-7}{x^2+x-2} = \dfrac{6}{x+2}$

5. Simplify: $\dfrac{\dfrac{5}{x} - \dfrac{4}{x-2}}{\dfrac{-9}{x^2 - 2x}}$

6. Graph the parabola $y = x^2 - 4x - 2$. Show the axis of symmetry, the x-intercepts, the y-intercept and the vertex.

7. Solve for x and simplify your answer. You may use any method:

$$5x^2 - 2x = 1$$

8. Solve for the equation $x^2 = 5 + 6x$ by completing the square.

9. Divide the complex numbers $\dfrac{5 - 7i}{7 - 5i}$ and simplify your answer.

10. (a) Simplify $\left(\dfrac{16x^{20}y^{31}}{2x^{14}y^7}\right)^{1/3}$, where $x, y > 0$. (b) Simplify $\left(\dfrac{4}{9}\right)^{-3/2}$

11. Rationalize the denominator of:

(a) $\dfrac{8}{3 - \sqrt{7}}$

(b) $\dfrac{3}{2\sqrt{6}}$

12. Simplify the expressions:

(a) $4\sqrt{32} - \sqrt{50} - 2\sqrt{12}$

(b) $(2 + 2\sqrt{3})^2$

13. Find all solutions between $0°$ and $360°$ of the equation $\cos(x) = -.456$

14. Find the exact value of $\sin(\theta)$ and $\tan(\theta)$, for an angle θ in the third quadrant with known $\cos(\theta) = -\frac{1}{7}$.

15. Solve the equations:

(a) $\log_{125}\left(\frac{1}{5}\right) = x$

(b) $3^{8+9x} = \frac{1}{27}$.

16 Find the exact value for the following:

(a) $\sec(60°)\tan(2\pi/3)$

(b) $\sin(3\pi/4) + \cos(7\pi/6)$

17. Sketch the graph of $y = 3\cos(x)$ in the interval $-2\pi \leq x \leq 2\pi$.

18. Verify the identity: $\sin^2(x) - \cos^2(x) = \dfrac{1 - \cot^2(x)}{1 + \cot^2(x)}$:

19. The angle of elevation from a point in the ground to the top of a building is $25°$. If the distance from the point on the ground to the base of the building is 300 feet. How high is the building?

20. Complete the table and sketch the graph of $y = 3^x$

x	-2	-1	0	1	2
y					

y

x