BRONX COMMUNITY COLLEGE
of the City University of New York

DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE

MATH 06 Exam 3
Nikos Apostolakis November 25, 2009

Name: _____

Directions: Write your answers in the provided space. To get full credit you *must* show all your work. Simplify your answers whenever possible. Be certain to indicate your final answer clearly. **Each problem is worth** 5 **points.** This exam is due **December 1, 2009**.

Perform the indicated operators and simplify the result:

1. $\dfrac{4}{x-7} - \dfrac{3x-13}{x^2-12x+35}$

2. $\dfrac{2a}{a+8} \div \dfrac{2a+6a^2}{a^2+5a-24}$

3. Simplify: $\dfrac{\dfrac{5}{z-2} - \dfrac{3}{z-3}}{\dfrac{2z}{z^2-5z+6}}$

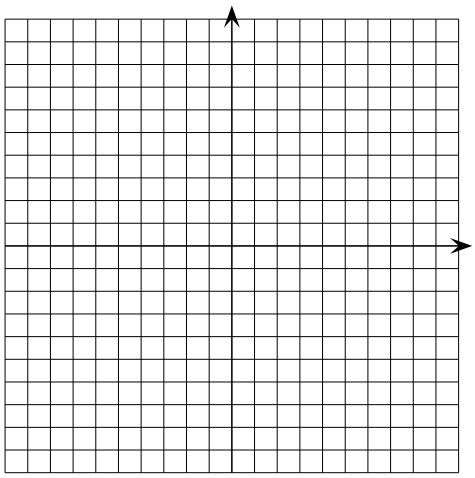
Solve for x:

4. $\sqrt{x+22} - x = 10$

5. $\dfrac{2}{x+3} + \dfrac{4}{x^2-7x+12} = \dfrac{3}{x+4}$

6. $9x^2 + 22 = 30x$. Express the solutions in the simplest radical form.

7. Graph the parabola $y = 2x^2 - 12x + 15$. Show the vertex and the axis of symmetry. Also find the y–intercept.



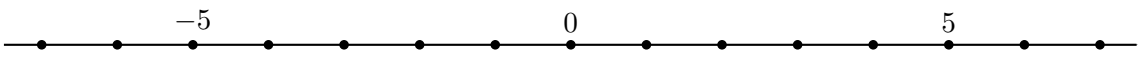
8. Find the center and the radius of the circle with equation: $x^2 + y^2 - 6x + 8y = 21$.

9. Divide $\dfrac{21 + 8i}{2 - 4i}$. Express the result in the standard $a + bi$ form, where a and b are real numbers.

10. A. Express $36^{-\frac{3}{2}}$ as a fraction.

B. Simplify $\left(\dfrac{27x^{35}y^{16}}{x^5y^7}\right)^{\frac{1}{3}}$

11. Solve for x: $|2 + 3x| \geq 11$. Graph the solution set in the real number line.



12. Simplify:

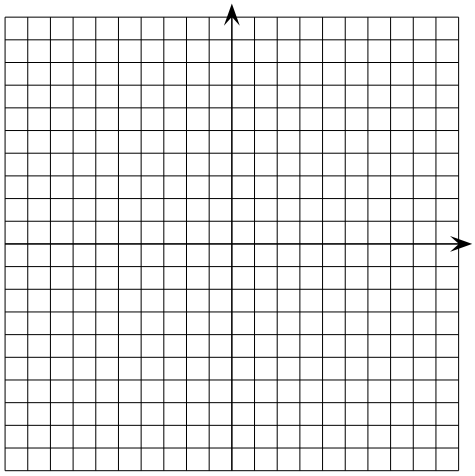
A. $5\sqrt{48} - 3\sqrt{80} + 7\sqrt{20}$

B. $(2\sqrt{5} + 3)^2$

13. A. Simplify $\log_8 \frac{1}{2}$

B. Solve for x: $27^{5-2x} = \frac{1}{9}$

14. Solve graphically: $3x - 2y \geq 6$.



15. One acute angle of a right triangle is $30°$. If the hypotenuse is 20 units long, solve the triangle.

16. An angle in standard position whose terminal side lies in the third quadrant has $\sin\theta = -\frac{7}{13}$. Find the exact values of $\cos\theta$ and $\tan\theta$.

17. What is the positive angle that the ray from the origin $(0, 0)$ to the point $(4, -5)$ forms with the positive x–axis?

18. Find the exact value for each of the following:

(a) $\sin 765^\circ$

(b) $\tan -1320^\circ$

(c) $\cos 990^\circ$

19. The angle of elevation in a sailboat in a lake to the top of the nearest hill is 75°. If the boat is 300 feet from the foot of the cliff, how high is the cliff?

20. Use a table of values to graph $y = 3^x$.