BRONX COMMUNITY COLLEGE
of the City University of New York

DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE

MATH 06 — Practice Final I
Nikos Apostolakis — December 8, 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.**

Perform the indicated operators and simplify the result:

1. $\dfrac{2x-7}{x^2-2x-15} - \dfrac{5}{x+3}$

2. $\dfrac{x^2-25}{2x-3} \div \dfrac{x^2+x-30}{4x^2-6x}$

3. Simplify: $\dfrac{\dfrac{2}{a-5} - \dfrac{7}{a+3}}{\dfrac{6a}{a^2-2a-15}}$

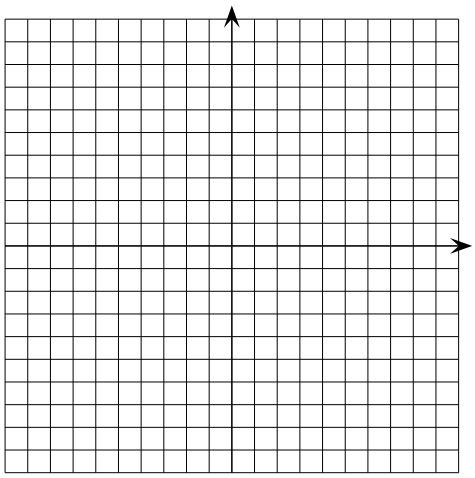
Solve for x:

4. $\sqrt{x+30}+2x=-5$

5. $\dfrac{x}{x^2+2x-15}+\dfrac{2}{x+5}=\dfrac{24}{x-3}$

6. $x^2-1=4x$. Express the solutions in the simplest radical form.

7. Graph the parabola $y=x^2+6x+4$. Show the vertex and the axis of symmetry. Also find the y–intercept.



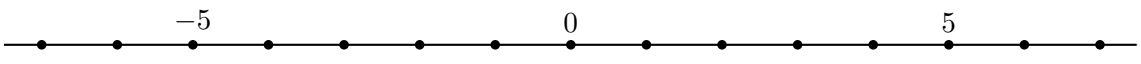
8. Find the center and the radius of the circle with equation: $x^2 + y^2 + 10x - 6y = 15$.

9. Divide $\dfrac{19 + 3i}{6 - i}$. Express the result in the standard $a + bi$ form, where a and b are real numbers.

10. A. Express $125^{-\frac{2}{3}}$ as a fraction.

B. Simplify $\left(\dfrac{81x^{30}y^{25}z^8}{x^2y}\right)^{\frac{1}{4}}$

11. Solve for x: $|2 - 3x| \leq 10$. Graph the solution set in the real number line.



12. Simplify:

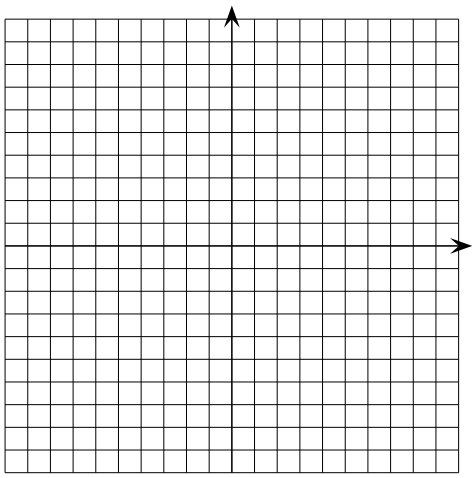
A. $3\sqrt{20} + 2\sqrt{48} - 5\sqrt{75}$

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

13. A. Simplify $\log_{125} \dfrac{\sqrt{5}}{5}$

B. Solve for x: $81^{2-x} = \sqrt{3}$

14. Solve graphically: $2x - 5y < 10$.



15. The terminal side of an angle θ, in standard position, lies in the fourth quadrant, and $\sin\theta = -\frac{5}{13}$. Find the exact values of $\cos\theta$ and $\tan\theta$.

16. Find the exact values of each:

A. $\csc\frac{\pi}{6} \cdot \sin\frac{\pi}{4}$

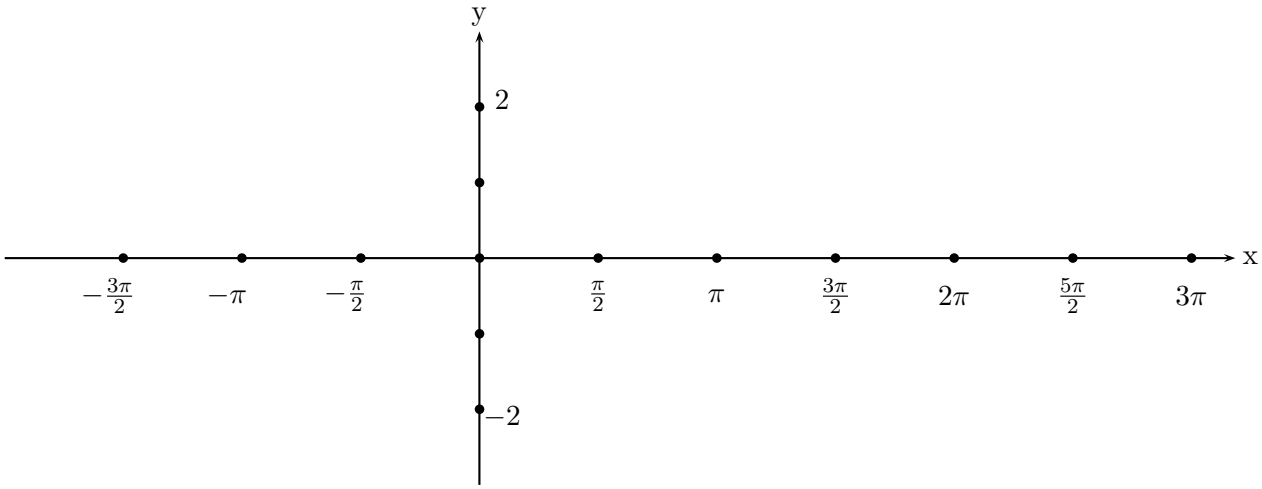
B. $\sin 30^\circ + \cos 210^\circ$

17. Verify the identity:

$$\sin x(\csc x - \sin x) = \cos^2 x$$

18. The angle of elevation in a sailboat in a lake to the top of the nearest hill is 80°. If the boat is 210 feet from the foot of the cliff, how high is the cliff?

19. Graph $y = -2\cos x$ for $-\pi \leq x \leq 3\pi$



20. Use a table of values to graph $y = \left(\frac{1}{2}\right)^x$.