BRONX COMMUNITY COLLEGE
of the City University of New York

DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE

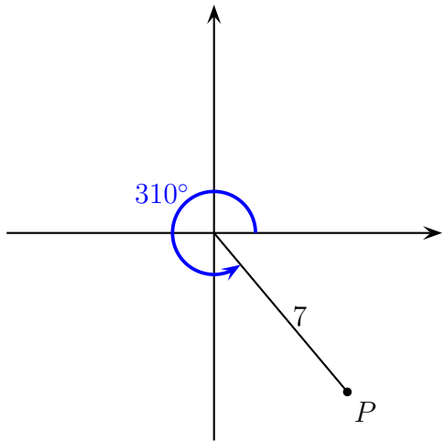
MATH 06 — Exam 2
Nikos Apostolakis — April 7, 2017

Due: April 21, 2017

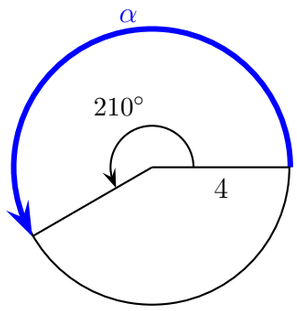
Directions: Write your answers in a seperate paper. Please staple all the sheets with your answers together. You *must* show all your work. Simplify your answers whenever possible. Be certain to indicate your final answer clearly. **Each problem is worth** 5 **points**

1. In a triangle ABC we have $B = 90°$, $a = \sqrt{7}$, and $b = \sqrt{13}$. Find c.
2. Simplify: $5\sqrt{44} + 2\sqrt{99} - 15\sqrt{11}$
3. Simplify: $(5 - \sqrt{5})^2 - 30 + 10\sqrt{5}$
4. Simplify, assuming all variables represent positive numbers: $\sqrt{\dfrac{49a^5b^4}{18c^6}}$
5. Simplify assuming all variables represent positive numbers. The answer should contain only positive integers as exponents.
$$\left(\frac{x^{10}y^{-5}}{z^{\frac{20}{3}}}\right)^{\frac{3}{5}}$$
6. Solve: $x - \sqrt{x-4} = 10$
7. Multiply. Express your answer in the form $a + bi$ where a and b are real numbers.
$$(2 + 5i)(-2 + 3i)$$
8. Divide. Express your answer in the form $a + bi$ where a and b are real numbers.
$$\frac{2 - 4i}{1 - i}$$
9. Simplify: $\dfrac{x^2 + 2x - 15}{x^2 - 10x + 21}$
10. Add: $\dfrac{6 - 2x}{x^2 - 9} + \dfrac{3}{x + 3}$. Simplify the result as much as possible.
11. Divide : $\dfrac{x^2 - 3x + 2}{x + 3} \div \dfrac{x^2 - 2x + 1}{x^2 + 5x + 6}$. Simplify the result as much as possible.
12. Solve: $\dfrac{5}{x - 4} = \dfrac{77}{x^2 - x - 12} + \dfrac{11}{x + 3}$
13. Solve: $\dfrac{3}{x + 7} - \dfrac{5}{x^2 + 2\,x - 35} = \dfrac{44}{x - 5}$
14. : Simplify: $\dfrac{\dfrac{5}{x-1} - \dfrac{2}{x+2}}{\dfrac{x+4}{x^2+x-2}}$

15. (a) Find the coordinates of the point P. Round your answer to the nearest hundredth.



(b) Find the length of the arc α, where the corner of the angle is at the center of the circle. Give an exact answer.



16. The angle of depression of a ship observed from the window of a lighthouse 250 ft above the sea level is 4°. How far is the ship?

17. Find the sine, cosine, tangent, and cotangent of 990°. Give *exact* answers.

18. For an angle θ in the third quadrant we have $\tan\theta = \dfrac{3}{4}$. Find $\sin\theta$.

19. A point P is at distance 4 from the origin $(0, 0)$ and forms and angle of 143.1301°. Find the coordinates of P.

20. Find the angle θ.