BRONX COMMUNITY COLLEGE
of the City University of New York

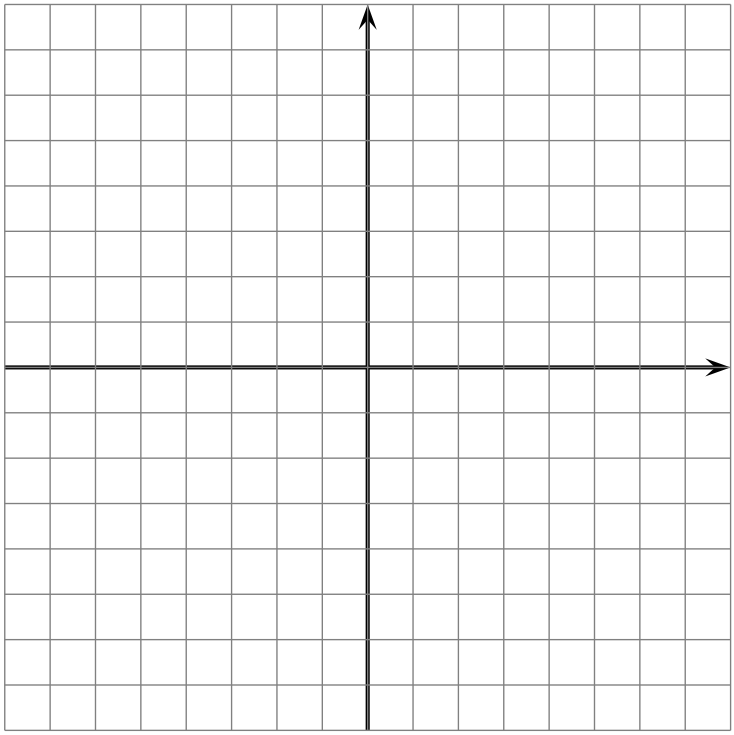
DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE

MATH 06 Exam 1
Nikos Apostolakis March 10, 2011

Name: _____

Directions: Write your answers in the provided booklets. Make sure to indicate which answer belongs to which question. 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**

1. Sketch a graph of the parabola $y = -x^2 - 2x + 3$. The graph should correctly indicate the vertex, the axis of symmetry, the x-intercepts, the y-intercept and the point symmetric to the y-intercept.



2. Evaluate (give *exact* answer). Simplify your answer as much as possible.

$$\sin 30^\circ \cos 45^\circ + \sin 45^\circ \cos 30^\circ$$

3. Simplify: $3\sqrt{20} - 2\sqrt{45} + 4\sqrt{125}$

4. Simplify: $\left(\sqrt{3} + \sqrt{2}\right)(\sqrt{3} - \sqrt{2})$

5. Simplify: $\left(3 - 2\sqrt{5}\right)^2$

A. $8^{-\frac{2}{3}}$ B. $\sqrt[3]{27x^7y^8z^9}$ C. $\dfrac{6}{\sqrt{3}}$

7. Rationalize the denominator. Simplify your answer as much as possible.

$$\frac{2\sqrt{10}}{3-\sqrt{5}}$$

8. Simplify. If needed assume that all variables represent positive numbers.

$$2\sqrt[4]{x^3}\left(\sqrt[4]{16x}-3\sqrt[4]{x^5}+\sqrt[4]{x^3}\right)$$

9. Simplify assuming all variables represent positive numbers. The answer should contain only positive integers as exponents.

$$\left(\frac{x^{-6}y^5}{z^{\frac{2}{3}}}\right)^{\frac{3}{2}}$$

10. Simplify, assuming all variables represent positive numbers: $\sqrt{\dfrac{12x^9y^4}{25z^5}}$

11. Solve $\sqrt{x+19}+x=1$.

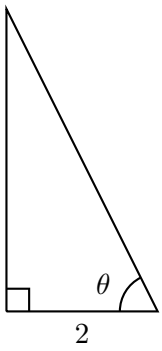
12. Solve $\sqrt{x+6}=1+\sqrt{x+1}$

13. Solve $x^2 - 4 = 2x$

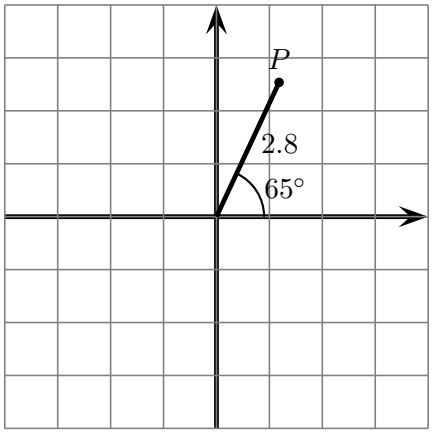
14. Solve $6x^2 - x - 1 = 0$

15. One leg of a right triangle is 5 inches and the hypotenuse is 10 inches. Find the length of the other leg.

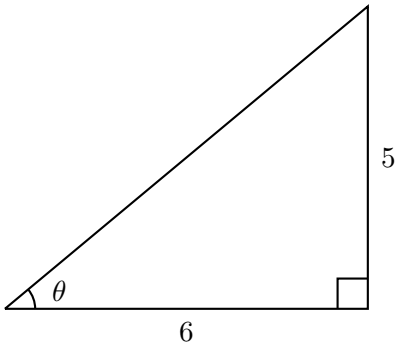
16. Find the area of the following triangle, if $\theta = 63.43°$.



17. Find the coordinates of the point P, if its distance from the origin is 2.8 units and the angle that OP forms with the x-axis is 65°, as shown in the figure below.



18. Find the angle θ:



19. The angle of elevation to the top of a building, measured from a point 100 feet away from the base of the building is 60°. Find the height of the building. Give *exact* answer.

20. A boat is observed from the top of a lighthouse, 300 feet above sea level. If the boat is 3000 feet away what's the angle of depression?