

BRONX COMMUNITY COLLEGE
of the City University of New York

DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE

MATH 06
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Exam 1
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. Solve: $x^2 - 2x + 2 = 0$
2. In a triangle ABC we have $A = 90^\circ$, $a = \sqrt{15}$, and $b = \sqrt{7}$. Find c .
3. One leg of a right triangle is 5 cm and the hypotenuse is 10 cm. Find the angles of the triangle.
4. The sum of the lengths of the legs of a right triangle is 4 cm. The hypotenuse is $3\sqrt{2}$ cm long. Find the lengths of the two legs.
5. Simplify: $2\sqrt{63} + 2\sqrt{28} - \sqrt{700}$
6. Simplify: $(\sqrt{6} - 5)(\sqrt{2} + \sqrt{3})$
7. Simplify: $49 - 12\sqrt{5} - (2 - 3\sqrt{5})^2$
8. Simplify, assuming all variables represent positive numbers: $\sqrt{\frac{12x^7y^2}{25z^4}}$
9. Solve: $\sqrt{x+4} - 2x = -7$
10. Solve: $\sqrt{x+6} + \sqrt{7-x} = 5$
11. Simplify assuming all variables represent positive numbers. The answer should contain only positive integers as exponents.

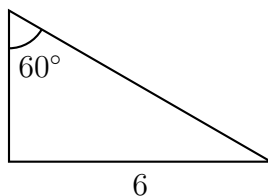
$$\left(\frac{x^{-6}y^4}{z^{\frac{3}{2}}}\right)^{\frac{2}{3}}$$

12. Multiply. Express your answer in the form $a + bi$ where a and b are real numbers.

$$(5 - 3i)(4 + 2i)$$

13. Evaluate $\frac{z^2 - z - 5}{z}$ when $z = 1 - 2i$. Express your answer in the form $a + bi$ where a and b are real numbers.

14. Find the area of the following triangle. Give an *exact* answer.



15. The angle of depression of a ship observed from the window of a lighthouse 150 ft above the sea level is 4° . How far is the ship?

16. Evaluate (give *exact* answer): $\frac{\cot 30^\circ}{2 - \tan 60^\circ}$
17. Find the sine, cosine, tangent, and cotangent of 1680° . Give *exact* answers.
18. Find the sine, cosine, tangent, and cotangent of -45° . Give *exact* answers.
19. For an acute angle θ we have $\tan \theta = \frac{3}{4}$. Find $\cos \theta$.
20. Find the length r and the angle θ .

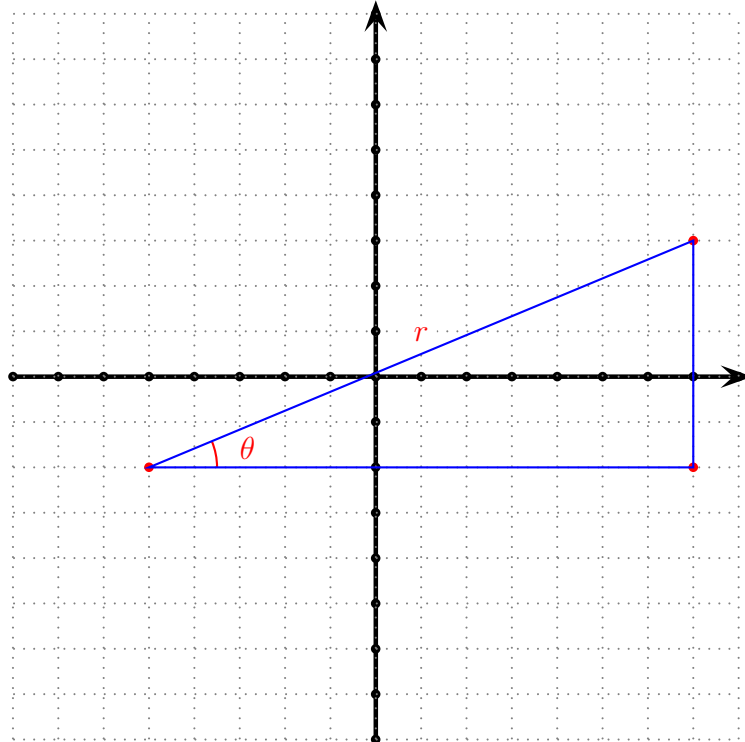


Table of trigonometric values

| θ | $\sin \theta$ | $\cos \theta$ | $\tan \theta$ | $\cot \theta$ |
|------------|----------------------|----------------------|----------------------|----------------------|
| 0° | 0 | 1 | 0 | und |
| 30° | $\frac{1}{2}$ | $\frac{\sqrt{3}}{2}$ | $\frac{\sqrt{3}}{3}$ | $\sqrt{3}$ |
| 45° | $\frac{\sqrt{2}}{2}$ | $\frac{\sqrt{2}}{2}$ | 1 | 1 |
| 60° | $\frac{\sqrt{3}}{2}$ | $\frac{1}{2}$ | $\sqrt{3}$ | $\frac{\sqrt{3}}{3}$ |
| 90° | 1 | 0 | und | 0 |