

PRE-AP PRE CALCULUS
2009 SUMMER ASSIGNMENT

Instructions:

The following assignment outlines the pre-requisite topics that should be mastered prior to entrance into Pre Calculus. The assignment is due on Friday, September 11, 2009, and will be graded as two homework assignments. Late assignments will be accepted only until Monday, September 14, 2009, with a 10% grade deduction. **NO ASSIGNMENTS WILL BE ACCEPTED AFTER MONDAY, SEPTEMBER 14, 2009.**

You will be graded on the completion, as well as the accuracy of your work; therefore you must **show all work** in order to receive full credit.

Assignments turned in without the appropriate supplemental work will result in a grade deduction. Be sure to place your final answers in the spaces provided.

A Pre-Requisite Chapter Assessment will take place on Wednesday, September 16, 2009. All students will be held accountable for the material on the assessment.

HAVE A GREAT SUMMER! SEE YOU IN SEPTEMBER!!! 😊

Name: _____
Pre-AP Pre-Calculus

Due: Fri, September 11, 2009
Summer Assignment

Chapter P Prerequisites

P.1-P.3 Major Concepts

Section 1 Objective Students will be able to convert between decimals and fractions, write inequalities, apply the basic properties of algebra, and work with exponents and scientific notation.

Section 2 Objective Students will be able to graph points, find distances and midpoints on a number line and in a coordinate plane, and write standard-form equations of circles.

Section 3 Objective Students will be able to solve linear equations and inequalities in one variable.

1. Classify the interval $[3, \infty)$ as open, half-open, or closed. _____
Then classify it as unbounded or bounded. _____
2. Is the interval $(-\infty, \infty)$ open, closed, or both? _____
3. Complete the equation to give an example of the property.
 - a. Commutative property of addition: $3 + x =$ _____
 - b. Associative property of multiplication: $52(xy) =$ _____
 - c. Distributive property of multiplication $3(x + y) =$ _____

over addition:

d. Symmetric property of equality: If $3x + 5y = 38$ then _____

e. Addition property of equality: If $2a = 7x$ and $3b = 8y$ then _____

4. Is the distance between points independent of their orders? In other words, is the distance between points P and Q the same as the distance between Q and P ? _____

5. Find the distance between $O(0, 0)$ and $P(x, y)$. _____

6. Find the midpoint of the line segment with endpoints $O(0, 0)$ and $P(x, y)$. _____

7. Explain why multiplying both sides of the equation $2x + 3 = 5$ by x does not produce an equivalent equation.

8. Fill in the blank: We reverse the direction of the inequality sign when we multiply or divide both sides of an inequality by a(n) _____ number.

9. How many solutions does a linear equation in one variable have? _____

10. How many solutions does a linear inequality in one variable have? _____

11. Are the inequalities $-5x + 2 \leq 12$ and $x \leq -2$ equivalent? Explain.

P.4–P.5 Major Concepts

Section 4 Objective Students will be able to use the concepts of slope and y-intercept to graph and write linear equations in two variables.

Section 5 Objective Students will be able to solve equations involving quadratic, absolute value, and fractional expressions by finding x -intercepts or intersections on graphs, by using algebraic technologies, or by using numerical technologies.

In Exercises 4–5, fill in the blank.

1. How does the value of b affect the graph of an equation of the form $y = 2x + b$?

2. A line has equation $ax + by = c$ where $a > 0$, $b < 0$, and $c < 0$.
What can you say about the x -intercept, y -intercept, and slope of the line?

3. Write an equation of a function that does *not* represent a linear function.

4. Two lines in the coordinate plane are _____ if they have the same slope, but different y -intercepts.

5. A line with slope $\frac{3}{5}$ is perpendicular to lines with slope _____.

6. Suppose the graphs of $y = g(x)$ and $y = h(x)$ intersect at $(-2, 3)$, $(1, -4)$, and $(5, 10)$. What are the solutions of $g(x) = h(x)$?

7. To solve an equation by finding x -intercepts, Cynthia graphed the function $y = x^3 - 5x + |2x - 3|$. Give several possibilities for the original equation.

8. True or false:

a. $|3x - 5| = |2x + 4|$ if and only if $3x - 5 = 2x + 4$ or $3x - 5 = -(2x + 4)$ _____

b. $|2x + 7| = -4$ if and only if $2x + 7 = 4$ or $2x + 7 = -4$ _____

9. Use the quadratic formula to find the roots of $x^2 + bx + c$. Then find the sum and the product of the roots.

Sum _____

Product _____

P.6–P.7 Major Concepts

Section 6 Objective Students will be able to add, subtract, multiply, and divide complex numbers, and to find complex zeros of quadratic functions.

Section 7 Objective Students will be able to solve inequalities involving absolute value, quadratic polynomials, and expressions involving fractions.

1. Name *two* square roots of -1 .

2. Fill in the blanks.

For the complex number $a + bi$ in standard form, the real number a is called the _____ part and the real number _____ is called the imaginary part. The complex conjugate of $a + bi$ is the complex number _____.

3. Suppose that x and y are real numbers such that $(2 + 3x) - (5 - 3y)i = 11 + 7i$. Find the values of x and y .

$x =$ _____

$y =$ _____

4. Write an expression in standard form for the quotient $\frac{a + bi}{c + di}$ of two complex numbers.

5. Write an expression for the sum of a complex number $a + bi$ and its complex conjugate. _____ Is this sum a real number, a complex number, or both? _____
6. Write an expression for the product of a complex number $c + di$ and its complex conjugate. _____ Is this product a real number, a complex number, or both? _____
7. Brad says that a quadratic equation $ax^2 + bx + c = 0$ has complex roots only if $b^2 - 4ac < 0$. Do you agree? Explain.
8. A quadratic equation $x^2 + bx + c = 0$ has the complex roots $3 + 6i$ and $3 - 6i$. Find the values of b and c .
- $b =$ _____ $c =$ _____
9. Find a value of a such that it is *not* true that $|x| < a$ if and only if $-a < x < a$. Solve $|x| < a$ for your values of a .