

Honors Precalculus Summer Assignment Freehold Township High School

Welcome to Honors Precalculus! The assignment has been created from the Prerequisite Chapter of your book as a means of reviewing important skills and concepts that you have learned. The assignment will give you insight as to what you need to know fluently to be successful in Honors Precalculus. These are skills that you have covered previously and must be proficient in as we progress through the year. If you are not certain of a particular skill or process, use the internet or online book to research and practice. The book can be accessed here:

Website: <http://www.phschool.com/>

Webcode: azk-4007

You should complete all the problems on separate sheets of paper. The assignment is due on the first day of class and will count as a large classwork assignment. There will be a 10% deduction for late assignments.

We will use the Texas Instruments TI-84 Plus calculator in class. Although you are not required to purchase your own graphing calculator, it is highly advantageous to have your own. There will be a set of graphing calculators in class, but they must remain in the classroom at all times.

Try not to put this assignment off until the end of the summer. Work in short segments throughout the summer so that it will not be a burden on you. Make sure you know the material. We look forward to seeing all of you next year.

Have a wonderful summer!

Exercise numbers with a gray background indicate problems that the authors have designed to be solved *without a calculator*.

The collection of exercises marked in red could be used as a chapter test.

In Exercises 1 and 2, find the endpoints and state whether the interval is bounded or unbounded.

- $[0, 5]$
- $(2, \infty)$
- Distributive Property** Use the distributive property to write the expanded form of $2(x^2 - x)$.
- Distributive Property** Use the distributive property to write the factored form of $2x^3 + 4x^2$.

In Exercises 5 and 6, simplify the expression. Assume that denominators are not zero.

5. $\frac{(uv^2)^3}{v^2u^3}$ 6. $(3x^2y^3)^{-2}$

In Exercises 13 and 14, find (a) the distance between the points and (b) the midpoint of the line segment determined by the points.

13. -5 and 14 14. $(-4, 3)$ and $(5, -1)$

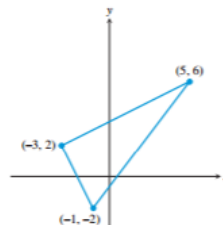
In Exercises 17 and 18, find the standard form equation for the circle.

- Center $(0, 0)$, radius 2
- Center $(5, -3)$, radius 4

In Exercises 19 and 20, find the center and radius of the circle.

- $(x + 5)^2 + (y + 4)^2 = 9$
- $x^2 + y^2 = 1$

- (a) Find the length of the sides of the triangle in the figure.
(b) **Writing to Learn** Show that the triangle is a right triangle.



23. Finding a Line Segment with Given Midpoint

Let $(3, 5)$ be the midpoint of the line segment with endpoints $(-1, 1)$ and (a, b) . Determine a and b .

- Finding Slope** Find the slope of the line through the points $(-1, -2)$ and $(4, -5)$.
- Finding Point-Slope Form Equation** Find an equation in point-slope form for the line through the point $(2, -1)$ with slope $m = -2/3$.
- Find an equation of the line through the points $(-5, 4)$ and $(2, -5)$ in the general form $Ax + By + C = 0$.

In Exercises 27–32, find an equation in slope-intercept form for the line.

27. The line through $(3, -2)$ with slope $m = 4/5$
28. The line through the points $(-1, -4)$ and $(3, 2)$
29. The line through $(-2, 4)$ with slope $m = 0$
30. The line $3x - 4y = 7$
31. The line through $(2, -3)$ and parallel to the line $2x + 5y = 3$
32. The line through $(2, -3)$ and perpendicular to the line $2x + 5y = 3$

33. **SAT Math Scores** Scores on each part of the SAT are on a scale of 200–800. Table P.10 shows the average SAT math score for selected years.



Table P.10 Average SAT Math Scores

| Year | Scaled Scores |
|------|---------------|
| 1995 | 506 |
| 2000 | 514 |
| 2005 | 520 |
| 2006 | 518 |
| 2007 | 515 |
| 2008 | 515 |
| 2009 | 515 |
| 2010 | 516 |
| 2011 | 514 |

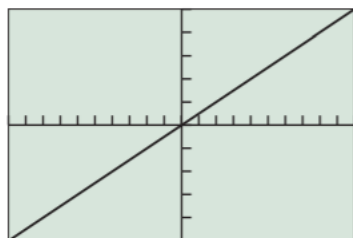
Source: The College Board, The World Almanac and Book of Facts 2012.

- (a) Draw a scatter plot of the data.

34. Consider the point $(-6, 3)$ and Line $L: 4x - 3y = 5$. Write an equation (a) for the line passing through this point and parallel to L , and (b) for the line passing through this point and perpendicular to L . Support your work graphically.

In Exercises 35 and 36, assume that each graph contains the origin and the upper right-hand corner of the viewing window.

35. Find the slope of the line in the figure.



$[-10, 10]$ by $[-25, 25]$

In Exercises 37–52, solve the equation algebraically without using a calculator.

37. $3x - 4 = 6x + 5$
38. $\frac{x-2}{3} + \frac{x+5}{2} = \frac{1}{3}$
39. $2(5 - 2y) - 3(1 - y) = y + 1$
40. $3(3x - 1)^2 = 21$
41. $x^2 - 4x - 3 = 0$
42. $16x^2 - 24x + 7 = 0$
43. $6x^2 + 7x = 3$
44. $2x^2 + 8x = 0$
45. $x(2x + 5) = 4(x + 7)$
46. $|4x + 1| = 3$
47. $4x^2 - 20x + 25 = 0$
48. $-9x^2 + 12x - 4 = 0$
49. $x^2 = 3x$
50. $4x^2 - 4x + 2 = 0$
51. $x^2 - 6x + 13 = 0$
52. $x^2 - 2x + 4 = 0$

53. **Completing the Square** Use completing the square to solve the equation $2x^2 - 3x - 1 = 0$.

54. **Quadratic Formula** Use the quadratic formula to solve the equation $3x^2 + 4x - 1 = 0$.

In Exercises 55–58, solve the equation graphically.

55. $3x^3 - 19x^2 - 14x = 0$
56. $x^3 + 2x^2 - 4x - 8 = 0$
57. $x^3 - 2x^2 - 2 = 0$
58. $|2x - 1| = 4 - x^2$

In Exercises 59 and 60, solve the inequality and draw a number line graph of the solution.

59. $-2 < x + 4 \leq 7$
60. $5x + 1 \geq 2x - 4$

In Exercises 61–72, solve the inequality.

61. $\frac{3x-5}{4} \leq -1$
62. $|2x - 5| < 7$
63. $|3x + 4| \geq 2$

In Exercises 73–80, perform the indicated operation, and write the result in the standard form $a + bi$ without using a calculator.

73. $(3 - 2i) + (-2 + 5i)$
74. $(5 - 7i) - (3 - 2i)$
75. $(1 + 2i)(3 - 2i)$
76. $(1 + i)^3$
77. $(1 + 2i)^2(1 - 2i)^2$
79. $\sqrt{-16}$
80. $\frac{2 + 3i}{1 - 5i}$

82. **Navigation** A commercial jet airplane climbs at takeoff with slope $m = 4/9$. How far in the horizontal direction will the airplane fly to reach an altitude of 20,000 ft above the takeoff point?