



# KING SCHOOL

**Summer Assignment**

**MAT 400: Honors PreCalculus AB**

King School  
Honors PreCalculus AB Summer Assignment

Name: \_\_\_\_\_

Date: \_\_\_\_\_

**Directions:** Answer each of the following questions to the best of your ability. Make sure to show work to support each answer and circle your final answer for each question. Work neatly and try to show all of your work on the packet itself.

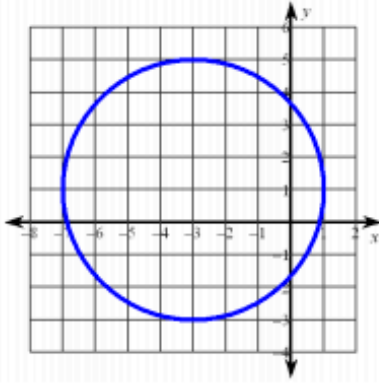
You will be quizzed on this material during the first or second week of school so please take your time. You may use the Internet to look up a topic, but you cannot use the Internet to get the answer to a specific question. Feel free to email Ms. O'Toole with questions if you have any! See everyone in September!

*I. Find the equation of a line in slope-intercept form given the following information:*

1. through $(5, -1)$ and $(0, 4)$	2. slope of $\frac{3}{2}$ and passes through $(2, 4)$
3. through $(-1, -1)$ and parallel to $y = -x - 5$	4. through $(5, -3)$ and perpendicular to $y = \frac{5}{2}x$
5. $f(-2) = 1$ and $f(-1) = 3$	6. through $(2, -4)$ and parallel to $x = 5$

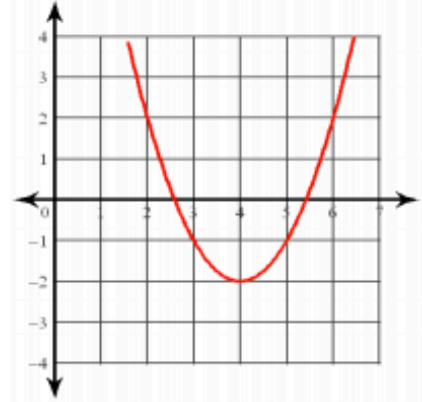
III. State the domain and range of the following relations:

1.



Domain: \_\_\_\_\_ Range: \_\_\_\_\_

2.



Domain: \_\_\_\_\_ Range: \_\_\_\_\_

3.  $\{(-2,3), (-1,0), (-4,5), (1,5), (2,7)\}$

$D_x$ : \_\_\_\_\_  $R_y$ : \_\_\_\_\_

4.  $x = -2$

$D_x$ : \_\_\_\_\_  $R_y$ : \_\_\_\_\_

V. Evaluate each function.

1. If  $f(a) = a^2 - 3a + 6$ , find :

a.  $f(-3)$

b.  $f(x + 2)$

c.  $f(2\sqrt{3})$

XII. Given the equation  $(x) = (x + 2)^2 - 1$ , find:

1. Vertex: \_\_\_\_\_

2. Axis of Symmetry: \_\_\_\_\_

3. Direction: \_\_\_\_\_

4. Max or Min Value: \_\_\_\_\_

5. x intercept: \_\_\_\_\_

6. y- intercept: \_\_\_\_\_

XIII. The height of a ball thrown vertically upward from ground level is  $h(t) = -32t^2 + 64t$ , where  $t$  is the time in seconds and  $h$  is the height.

1. Find the height when  $t = .5$
2. Find the time when the ball reaches its maximum height. (Hint: Find the vertex)
3. What is the maximum height?
4. After what time does the ball hit the ground? (Hint: Find  $t$  when  $h(t) = 0$  )

For #3-5, solve for  $x$  by factoring.

3.  $x^2 - x - 20 = 0$

4.  $4x^2 - 8x + 3 = 0$

5.  $x(3x - 7) = 6$

For #6 and 7, solve for x by taking square roots.

6.  $4x^2 = 25$

7.  $3(x+4)^2 = 8$

For #9-11, solve for x by completing the square.

9.  $x^2 + 6x = 7$

10.  $2x^2 - 7x + 10 = 0$

11.  $3x^2 - x - 8 = 0$

For #12-14, solve each absolute value equation.

12.  $2|x - 5| + 10 = 80$

13.  $3 - 4|7 - 2x| = 19$

14.  $|x + 5| = 2x - 1$

For #24-28, simplify and write each answer in a + bi form.

24.  $(1-i)(2+3i)$

25.  $(1-2i)+(5i+6)-(7i-19)$

26.  $\frac{4+i}{7i-1}$

27.  $(3+4i)^2$

28.  $\frac{5-i}{2i}$

For #29-31, solve each absolute value inequality algebraically and graph the solution on a number line.

29.  $|x+4| \geq 5$

30.  $-2|3x-7| > -14$

31.  $|5-6x|+10 \leq 25$



For #32-37, simplify each radical expression.

32.  $\sqrt{288}$

33.  $\sqrt{2x^3y^4}$

34.  $\sqrt[4]{16x^8y^6}$

35.  $\sqrt[3]{96x^{10}y^{16}z^3}$

36.  $\sqrt{\frac{x^5}{y^2}}$

37.  $\frac{4}{\sqrt{10}}$

For #38-40, find the product of each.

38.  $(4x+1)(2x-5)$

39.  $(3x-5)(4x^2-x+1)$

$$40. (4x + y - 10)(15 - 6x + 7y)$$

For #41-44, simplify each expression completely.

$$41. \frac{8z^3 - 1}{2z^2 + 5z - 3}$$

$$42. \frac{y^3 + 2y^2 + 4y}{y^3 + 2y^2} \cdot \frac{y^2 - 4}{y^3 - 8}$$

$$43. \frac{7x - 7y}{4y} \div \frac{14x - 14y}{3y}$$

$$44. \frac{5}{x^2 + x - 6} - \frac{2}{x - 2} + \frac{4}{x^2 - 4}$$

For #44-53, factor each expression completely.

44.  $x^3 + x$

45.  $18y^3 + 48y^2 + 32y$

46.  $16y - y^3$

47.  $5y + 3y^2 - 2y^3$

48.  $2(5x + 1)^2 - 18$

49.  $12x^2 + 22x - 20$

50.  $2ac - 2bd + 4ad - bc$

51.  $x^3 - 3x^2 - 4x + 12$

52.  $4y^3 - 20y^2 + 25y$

53.  $2x^3 - 16x^2 + 14x$

For #54-55, solve each equation and check for extraneous solutions.

$$\frac{2x}{x-1} + \frac{1}{x-3} = \frac{2}{x^2 - 4x + 3}$$

54.

55.  $\frac{x-3}{x} + \frac{3}{x+2} + \frac{6}{x^2+2x} = 0$

For #56-58, solve each inequality.

56.  $2x^2 + 17x + 21 \leq 0$

57.  $9x^2 + 12x + 4 \geq 0$

$$58. -6(3x - 4) + 5(10 - 2x) > 7x - 3(4x + 19)$$

For #59-60, solve each radical equation and check for extraneous solutions.

$$59. \sqrt{x^2 - 4x} = -4 + x$$

$$60. \sqrt{x-15} = 3 - \sqrt{x}$$

For #61-64, simplify each expression and write your answers with positive exponents only.

61. 
$$\frac{x^{-2}}{(x^5 y^{-4})^{-2}}$$

62. 
$$\frac{(m^2)^4}{m^3 m^2}$$

63. 
$$\frac{2x^2 y^4 \cdot 4x^2 y^4 \cdot 3x}{3x^{-3} y^2}$$

64. 
$$\frac{(2pm^{-1}q^0)^{-4} \cdot 2m^{-1}p^3}{2pq^2}$$

For #65-68, simplify each expression.

65. 
$$\left(\frac{42^{1/3}}{6^{1/3}}\right)^2$$

66. 
$$(5^{1/3} \cdot x^{1/4})^3$$

67. 
$$\frac{\sqrt[3]{x} \cdot \sqrt{x^5}}{\sqrt{25x^{16}}}$$

68. 
$$(\sqrt[3]{x^2} \cdot \sqrt[6]{x^4})^{-3}$$

69. Find the measures of the angles of a triangle whose sides are lengths 28, 47, and 34. Draw a picture first and round your answers to the nearest hundredth.

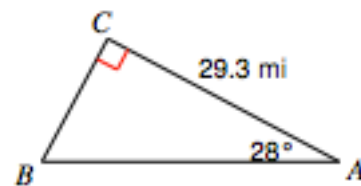
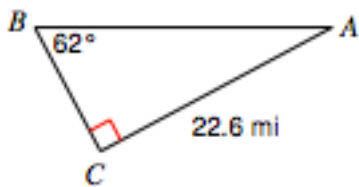
70. Convert to radians:  $340^\circ$

71. Convert to degrees:  $\frac{-24\pi}{9}$

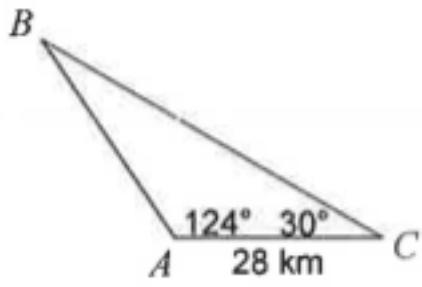
72.

In  $\triangle ABC$ ,  $m\angle A = 32$ ,  $a = 12$ , and  $b = 10$ . Find the measures of the missing angles and side of  $\triangle ABC$ . Round each measure to the *nearest tenth*.

73. Solve each triangle (find all missing sides and angles). Round answers to the nearest hundredth.







c.

74. Draw the angle  $-570^\circ$  in standard position.