



# KING SCHOOL

**Summer Assignment**

**MAT 300: Honors Algebra 2 / Trigonometry**

## *Summer Assignment*

MAT 300  
Honors Algebra 2 / Trig

### **Directions:**

This packet should be completed by the first day of school.

Make sure to bring the packet to class on the first day.

**The assignment is due the first day of class and will be graded.**

The Summer Assignment is designed for you to review your Algebra One skills and some Geometry.

This assignment will be checked for completeness, accuracy and presentation. All problems must be completed or, at a minimum, attempted. Show your work on every problem in the space provided or attached a page with the number of the exercise. Write neatly and write final answers in the spaces provided.

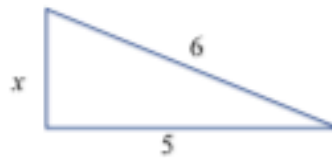
You will be assessed on the topics presented in this packet during the first or second week of school. You will be given an opportunity to ask some questions in class in the days prior to the assessment, but if you have trouble completing this packet you should contact me to reconsider your course placement.

- You should not work together with other students, nor receive extensive help from a tutor
- Do not use a calculator, except to check your results, unless the problem explicitly states that you may use one.
- Answers must be written in simplest/reduced form. No decimal approximations, only exact answers.
- You may look up concepts/topics that you have forgotten on the internet, but do not search for answers to specific problems.

Have fun and have a great Summer!

1. The perimeter of a triangle is 14. Find the length of side  $x$ .

\_\_\_\_\_   
 Answer



2. A rectangle has a perimeter of 18 inches. A new rectangle is formed by doubling the width,  $w$  and tripling the length,  $l$ . The new rectangle has perimeter 46 inches.

Write a system of equations to find the length and width of the original rectangle.

Solve the system.

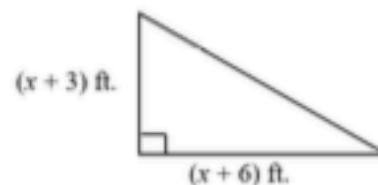
Answer:

length of original rectangle is \_\_\_\_\_

width of original rectangle is \_\_\_\_\_

3. The area of a right triangle is  $A = 119 \text{ ft}^2$

Find the value of  $x$  shown in the diagram.



Answer:  $x =$  \_\_\_\_\_

The base of the triangle is \_\_\_\_\_, The height of the triangle is \_\_\_\_\_.

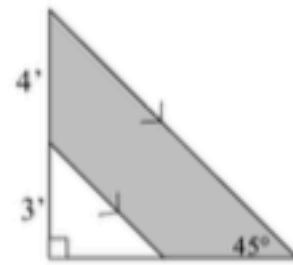
4. Given the following points:  $A(-3,7)$  and  $B(2,-5)$

The slope of  $\overline{AB}$  is \_\_\_\_\_

The midpoint of  $\overline{AB}$  is \_\_\_\_\_

The length of  $\overline{AB}$  is \_\_\_\_\_

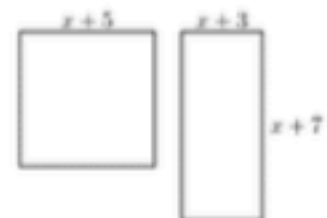
5. Find the area and the perimeter of the shaded region in the diagram.  
Answers should be exact. This means NO DECIMALS.



Area = \_\_\_\_\_

Perimeter = \_\_\_\_\_

6. For what values of  $x$  will the square and the rectangle shown at the right have the same perimeter?



Answer: They will have the same perimeter when  $x =$  \_\_\_\_\_

7. If you double all the sides of a square, a larger square results. (Draw and label a diagram.)

By what percentage has the perimeter increased? \_\_\_\_\_

By what percentage has the area increased? \_\_\_\_\_

8. Evaluate  $(10-3)^2 + 20 \div 4$

\_\_\_\_\_   
 Answer

9. Evaluate  $\frac{(37-26)^2 - 6}{32 \div 2^2 - (4^2 - 13)}$

\_\_\_\_\_   
 Answer

10. Evaluate  $(3a)^2 - 2b$  when  $a = 2$  and  $b = 4$ .

\_\_\_\_\_   
 Answer

11. Evaluate  $|6x - 3y|$  when  $x = \frac{2}{3}$  and  $y = \frac{5}{6}$

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Answer

12. An airplane travels at the rate of  $400 \frac{\text{miles}}{\text{hour}}$  for one and a half hours. How far does the plane travel?

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Answer

13. A group of friends takes a day-long trip down a river. The company that offers the tubing trip charges \$15 to rent a tube for a person to use and \$7.50 to rent a "cooler" tube, which is used to carry food and water in a cooler. The friends spend \$360 to rent a total of 26 tubes. How many of each type of tube do they rent?

Define your variables.

Set up a system of equations.

Solve the system.

Answer: They rent \_\_\_\_\_ regular tubes and \_\_\_\_\_ cooler tubes.

14. Working together, Merry and Pippin can build a wall in 4.5 hours. If Merry can do the job in 6 hours working alone, how long would it take Pippin to build the wall when working alone?

Answer: It will take Pippin \_\_\_\_\_ to build the wall working alone.

15. Find the value for  $h$  for which the slope of the line through  $(-5, 6)$  and  $(h, 12)$  is  $\frac{3}{4}$ .

$h =$  \_\_\_\_\_

16. Find the slope of the line through the points  $(a, -4b)$  and  $(b, 3a)$ , where  $a$  and  $b$  are constants.

$m =$  \_\_\_\_\_

17. Write the equation of the line in standard form,  $Ax + By = C$ , where  $A$ ,  $B$ , and  $C$  are constants and  $A > 0$  with the given characteristics.

a. Slope = 5 and  $x$ -intercept =  $a$  where  $a$  is a constant.

Equation \_\_\_\_\_

b. Parallel to  $y = -\frac{1}{4}x + 2$  passing through  $(2, -3)$ .

Equation \_\_\_\_\_

c. Perpendicular to  $2x - 3y = 6$  passing through  $(-8, 1)$ .

Equation \_\_\_\_\_

18. Solve for  $x$ :  $5x + 12 = -3x + 60$

Answer:  $x =$  \_\_\_\_\_

19. Solve for  $x$ :  $\frac{3x-7}{6} = \frac{2x}{3} - \frac{x+4}{2}$

Answer:  $x =$  \_\_\_\_\_

20. Solve for  $x$ :  $3|2x - 5| = 10$

Answer:  $x =$  \_\_\_\_\_

21. Solve the inequality  $-\frac{x}{7} \geq 3$  and graph the solution on a number-line.

Answer:

22. Solve the inequality  $-6 \leq 3x + 2 \leq 11$  and graph the solution on a number-line.

Answer:

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23. Solve the inequality  $7 - 3|4x - 2| \leq 1$  and graph the solution on a number-line.

Answer:

24. Solve the system of equations.

$$\begin{aligned} 5x + 4y &= 32 \\ 9x - y &= 33 \end{aligned}$$

Answer: \_\_\_\_\_

25. Simplify each expression. Your answers should not contain zero or negative exponents.

$\frac{x^{12}}{x^{-5}}$	$x^{n-2} \cdot x^2 \cdot x^{n+2}$
Answer:	Answer:
$\left(\frac{7}{3}a^4b^8\right)^5 \cdot \left(-\frac{9}{7}a^5b^{12}\right)$	$\frac{12a^5b}{6a^5} \cdot \frac{c^7}{2b}$
Answer:	Answer:

26. Factor completely:

$2a^2b^2 - 6ab^3 + 2a^3b$	$3x - xy - 3y + y^2$
Answer:	Answer:
$3x^2y^2 - 13xy^2 - 10y^2$	$-12x^2 + 27$
Answer:	Answer:
$72 - 32x^2$	$6x^2 - 5x - 4$
Answer:	Answer:
$4y^3 - 7y^2 - 16y + 28$	$-3x^2 - 10x - 3$
Answer:	Answer:

27. Solve by factoring.

$(x + 5)(x + 2) = 0$	$6x^3 - 18x^2 = 24x$
$x = \underline{\hspace{2cm}}$	$x = \underline{\hspace{2cm}}$

$x^2 + 5 = 8x - 10$     $x = \underline{\hspace{2cm}}$	$5x^3 - 30x^2 = -40x$     $x = \underline{\hspace{2cm}}$
$5x^2 - 10x = 0$     $x = \underline{\hspace{2cm}}$	$8x + 24 = 16x^2$     $x = \underline{\hspace{2cm}}$

28. Write in simplest radical form:

$5\sqrt{3} + \sqrt{48}$  Answer:	$(\sqrt{7} + \sqrt{2})(\sqrt{7} - 3\sqrt{2})$  Answer:
$\frac{\sqrt{5}}{\sqrt{8}}$  Answer:	$\sqrt{50} \cdot \sqrt{18}$  Answer:
$\frac{2}{5 - \sqrt{3}}$  Answer:	$\frac{2\sqrt{6}}{\sqrt{12}}$  Answer:

29. Factor the following expressions.

a.  $2mx + my - y - 2x$

Answer: \_\_\_\_\_

b.  $(a + b)y - ax - bx + x - y$

Answer: \_\_\_\_\_

30. Compute the value of the following expressions. Show all your work on a separate piece of paper. Do not use a calculator.

a.

$$\frac{\frac{1}{1 - \frac{8}{13}} + 1}{2 + \left(\frac{2}{1 - \frac{3}{13}}\right)} + \frac{\frac{1}{3 + \frac{1}{3}} + 1}{2 + \left(\frac{1}{2 + \frac{4}{3}}\right)} + \frac{\frac{1}{\frac{8}{7}} + 1}{2 + \left(\frac{1}{1 + \frac{1}{7}}\right)}$$

Answer: \_\_\_\_\_

b.

$$\left[ \frac{1 + \frac{1}{2} - \frac{4}{5}}{\frac{1}{3} + \frac{1}{5} + \frac{1}{8}} \cdot \frac{79}{7 \cdot (-2)^2} - 5 \right]^2 \div \frac{\frac{1}{3} + \left(\frac{1}{2} + \frac{1}{5}\right) \div \left(1 + \frac{3}{5}\right)}{-\left(\frac{1}{5} - \frac{3}{2}\right) \div (1 - 2^2 - 10)}$$

Answer: \_\_\_\_\_

31. Solve the following equation.

$$\frac{2x\sqrt{6} - \frac{1}{\sqrt{2}}}{2\sqrt{6}} - \frac{2x + \frac{1}{\sqrt{2}}}{\sqrt{2}} = \frac{\sqrt{3} \cdot \left(1 + \frac{1}{\sqrt{2}}\right) - 1}{1 - \sqrt{3}} + \frac{1 - \frac{\sqrt{6} + \sqrt{2}}{\sqrt{2} - \sqrt{6}}}{2\sqrt{2}}$$

Answer: \_\_\_\_\_

32. Solve the following system.

$$\begin{cases} \frac{4x-5y}{5} = \frac{83}{15} + \frac{x-2y}{3} \\ \frac{4x-y}{6} + \frac{3x-y}{4} = \frac{55}{12} \end{cases}$$

Answer: \_\_\_\_\_

33. Write the equation of a line that forms an angle of  $45^\circ$  with the x-axis and that goes through point A (4,1).

Answer: \_\_\_\_\_

34. Given A (0,3); B (4,1); C (3,5) and D (6,8), write the equations of the lines containing A, B and C, D. What is the relationship, if any, with the diagonals of I, III and II, IV quadrants?

Answer: \_\_\_\_\_