King School
Math 301 - Algebra 2/ Trigonometry
Summer Assignment

NAME _____

INSTRUCTIONS:

1. Read directions carefully and do work neatly and accurately.

2. If you are unsure of how to do a problem, DO NOT GIVE UP. Please read your notes from previous courses or use the internet resources (Khan Academy, etc).

3. Unless specified in the problem, ***calculators may not be used*** for these problems. Give your answers in exact form, including simplified radicals when necessary.

USEFUL FORMULAS

Slope-intercept form of a line: $y = mx + b$

Point-slope form of a line: $y - y_1 = m(x - x_1)$

Quadratic Formula: $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Pythagorean Theorem: $(1st\ leg)^2 + (2nd\ leg)^2 = (hypotenuse)^2$ or $a^2 + b^2 = c^2$

PART 1 – MULTIPLE CHOICE:

Choose the one best answer to each question. Write your answer (A-E) in the space provided. ***Please show all work on a separate sheet of paper with each question labeled. Correct answers with no supporting work may not receive credit.***

1. When using the quadratic formula to solve $3x^2 + 5x - 4 = 0$, the value of b in the formula would be:

A. 3 **B.** 5 **C.** - 4 **D.** 0 **E.** None of these

Answer _____

2. Accurate to the nearest tenth, the dimensions of a rectangle (in cm) whose perimeter is 10 cm and whose area is 3 sq cm are:

A. 5.5 X 0.5 **B.** 4.3 X 0.7 **C.** 4.5 X 0.5 **D.** 3.5 X 1.5 **E.** None of these

Answer _____

3. Using a calculator, find $\sin(42°)$.

A. 0.6719 **B.** 0.7406 **C.** 0.9073 **D.** 42.2167 **E.** 0.6691

Answer _____

4. Using a calculator, find a measure of angle x such that $\cos x = 0.2345$.

A. 13.34° **B.** 76.44° **C.** 13.11° **D.** 1° **E.** 14°

Answer _____

5. Find the quotient: $\frac{x^2y}{3z} \div \frac{6x^3}{5yz^2}$

A. $\frac{2x^5}{5z^3}$ **B.** $\frac{2y^2z}{5x}$ **C.** $\frac{5y^2z}{18x}$ **D.** $\frac{2z}{5x}$

Answer _____

6. Which of the following is simplest form of $\frac{5}{x+2} - \frac{8}{x+4}$?

A. $\frac{-3x+36}{x^2+6x+8}$ **B.** $\frac{-3x+4}{x^2+6x+8}$ **C.** $\frac{-5}{x+4}$ **D.** $\frac{-3x+4}{x^2+8}$

Answer _____

7. Simplify the following fraction: $\frac{x^2+x-6}{2x^2-7x+6}$

A. $\frac{x+3}{2x-3}$ **B.** $\frac{x-1}{2x-7}$ **C.** -6 **D.** $\frac{-x-1}{-7x+8}$

Answer _____

PART 2 – EXERCISES:

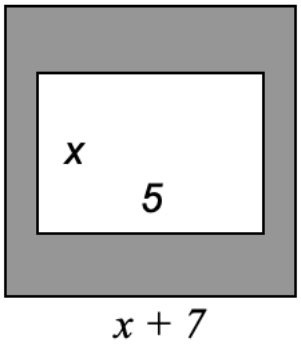
Answer all questions in the space provided. Perform all indicated operations ***showing all work.*** ***Circle your final answers***. All exercises and word problems must be solved ***algebraically***.

1. An 11-inch by 16-inch painting is in frame with uniform width, *x.* The area of the frame alone is 124 square inches.

    a. Draw a picture and write an equation in terms of *x*.

    b. Solve the equation and give the width of the frame.

2. Find the area of the shaded region in terms of x.



3. Factor the following polynomials.

a. $a^2 + 8ab - 48b^2$	b. $36k^4 - 48k^3 + 16k^2$
c. $27a^3b - 12ab$	d. $2x^4 - 15x^2 - 27$
e. $5x^2 - 13x + 6$	f. $m^2 + 7m - 18$

4. Solve.

a. $y^2 - 36 = -12y$

b. $\frac{3c}{c-1} - \frac{4}{c+1} = \frac{4}{c^2-1}$

c. $\frac{1}{2}(12 - 4w^2) - 2w(1 - w) = 8$

5. Simplify the following expressions.

a. $\frac{3m-mv}{6m^2v} \cdot \frac{3}{9-v^2}$

b. $\frac{1}{a^2-9} + \frac{1}{a^2+6a+9}$

c. $\frac{2x-y}{2y-x} \div \frac{4x^2-y^2}{4y^2-x^2}$

d. $\frac{b+1}{(b-1)^2}+\frac{2-2b}{(b-1)^3}+\frac{1}{b-1}$

e. $(2x^2-3xy+y^2)(2x-y)$

6. Simplify. Give answers using positive exponents.

a. $(2x^0y^{-5}z^3)^3$

b. $\left(\frac{y^5}{y^{-2}}\right)^{-3}$

c. $3x^{-2}(3x^2)^{-1}$

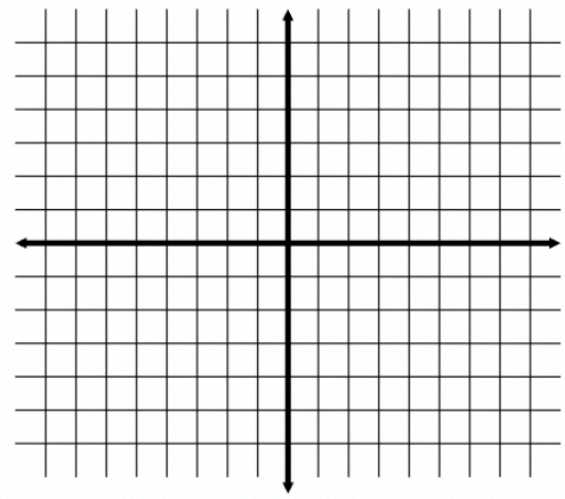
d. $\frac{3^{-4}\cdot 3^2}{3^{-2}}$

7. The width and length of a rectangle with a perimeter of 36 cm are such that the area of the rectangle is 80 cm². Find the dimensions of the rectangle.

8. A line has a slope of $-\frac{2}{5}$ and passes through the point $(5, 7)$.

    a. Write the equation of the line in point-slope form.

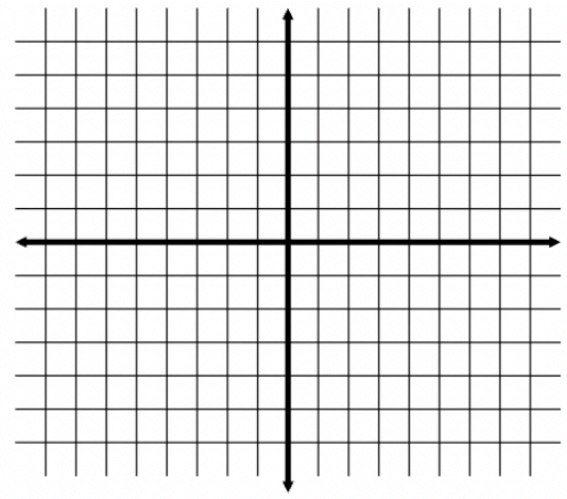
    b. Graph the line on the axes provided.



9. A line passes through the points $(-3, -1)$ and $(1, -4)$.

   a. Write the equation of the line in slope-intercept form.

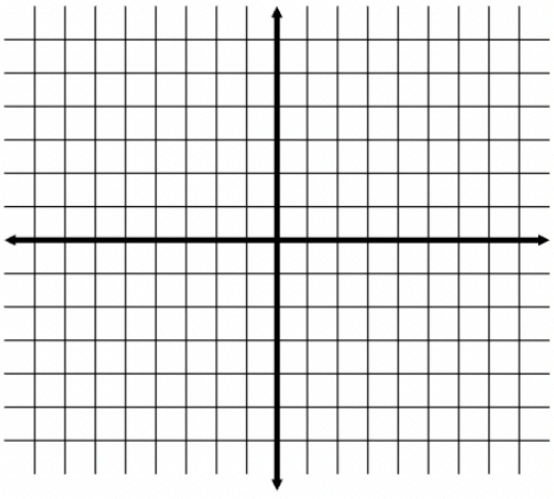
   b. Graph the line on the axes provided.



10. Solve the following system of equations by graphing and then write the solution on the space provided.

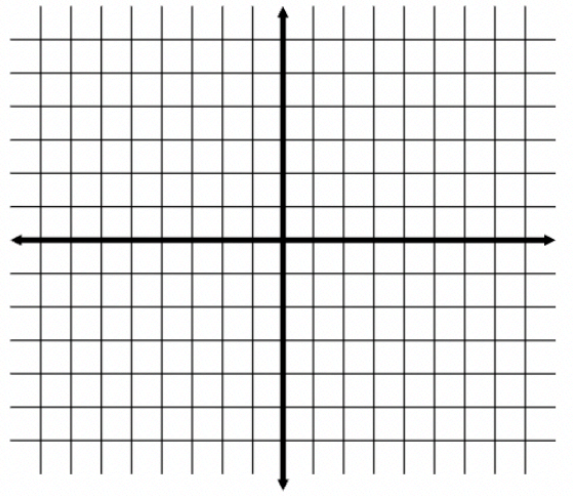
$$\begin{cases} x = 6 + y \\ 2x + y = 0 \end{cases}$$

Answer: _____



11. Graph the inequality

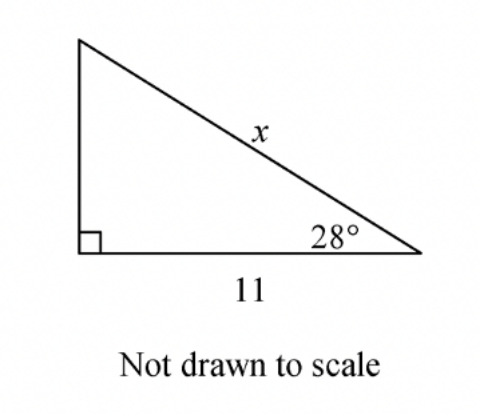
$$5y - 8 < 2(x + 2y)$$



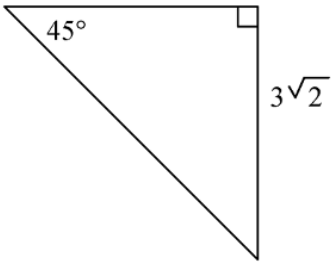
12. Solve each equation for x.

a. $A = Bxt + C$	b. $\frac{rx+sx}{t} = 1$
c. $\frac{x}{a} = \frac{y}{b}$	d. $\frac{x+2}{y-1} = 2$

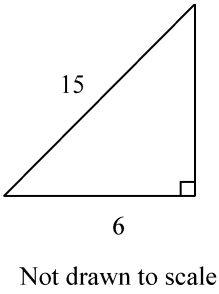
13. Solve for x.



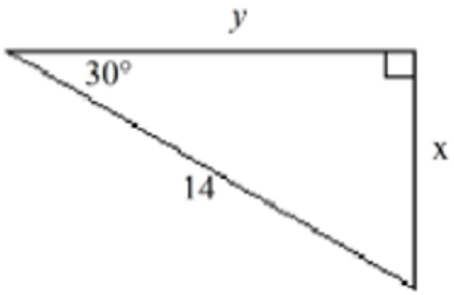
14. Find the length of the hypotenuse. (Hint: “special right triangles”)



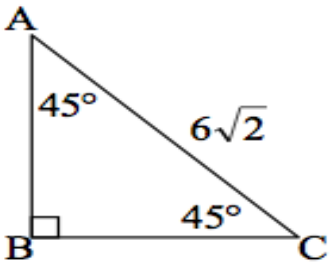
15. Find the exact length of the missing side.



16. Find the exact values of x and y. (Hint: "special right triangles")



17. Find the missing sides. (Hint: "special right triangles")



18. A 20-foot ladder is leaned against a wall. If the base of the ladder is 8 feet from the wall, how high up the wall will the ladder reach?

19. The angle of elevation from an observer on the street to the top of a building is 55.6°. If the observer is 150 feet from the base of the building, how tall is the building to the nearest hundredth of a foot? You may use a ***calculator*** to solve this problem.