



KING SCHOOL

Summer Assignment

MAT 301: Algebra 2 / Trigonometry

King

Algebra 2/Trigonometry Summer Assignment

NAME: _____

INSTRUCTIONS

1. Read directions carefully and work neatly and accurately. Show your work on a separate paper.

2. If you are unsure of how to do a problem, DO NOT GIVE UP. Please refer to your notes from previous courses or the Internet. For example, Khan Academy, <https://www.khanacademy.org/math/algebra>. You can also email your previous mathematics teachers.

Useful Formulas

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

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

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

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

PART 1 MULTIPLE CHOICE:

Choose the one best answer to each question. Place the letter of the best answer in the space to the left of each number. **Please show all work on a separate sheet of paper with each question labeled. Correct answers with no supportive work may not receive credit.**

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

- A 3 B 5 C -4 D 0 E none of these

_____ 2. Accurate to the nearest tenth, the dimensions of a rectangle 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

_____ 3. Using a calculator, find $\sin(42^\circ)$

- A 0.6719 B 0.7406 C 0.9073 D 42.2167 E 0.6691

_____ 4. Using a calculator, find a measure of angle x , if $\cos(x) = 0.2345$

- A 13.34° B 76.44° C 13.11° D 1° E 14°

_____ 5. What is the quotient for: $\frac{x^2y}{3z} \div \frac{6x^3}{5yz^2}$

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

_____ 6. Which of the following is the 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 $\frac{-3x+4}{x^2+8}$

_____ 7. Reduce 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 $\frac{-6}{1}$ D $\frac{-x-1}{-7x+8}$

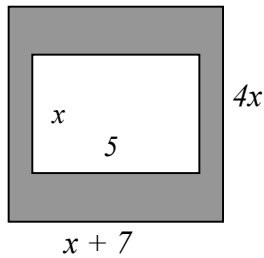
PART II EXERCISES:

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

1. (a) Write an equation in which x is the width of a uniform frame around a painting which is 11 in. wide and 16 in. long. The area of the frame alone is 124 square inches. (Draw a picture first.)

(b) Solve the equation and write the width of the frame.

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



3. Factor the following:

a) $a^2 + 8ab - 48b^2$

b) $36k^4 - 48k^3 + 16k^2$

c) $27a^3b - 12ab$

d) $2x^4 - 15x^2 - 27$

f) $5x^2 - 13x + 6$

g) $m^2 + 7m - 18$

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:

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) $(b^5 \cdot b^{-7})^3$

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

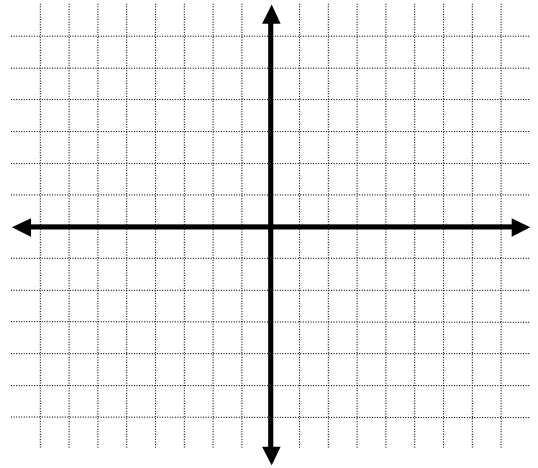
d) $3x^{-2} \cdot (3x^2)^{-1}$

e) $\frac{3^{-4} \cdot 3^2}{3^{-2}}$

7. The width and length of a rectangle with a perimeter of 36 cm are such that the area of the rectangle is 80 cm^2 . Find the dimensions of the rectangle.

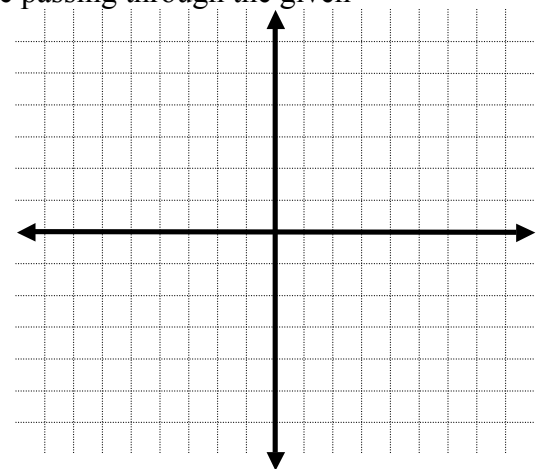
8. a) Write an equation in point-slope form of the line described:

$\text{slope} = -\frac{2}{5}$; passes through $(5, 7)$



b) Now graph the line.

9. a) Write an equation in slope-intercept form of the line passing through the given points: $(-3, -1)$, $(1, -4)$.

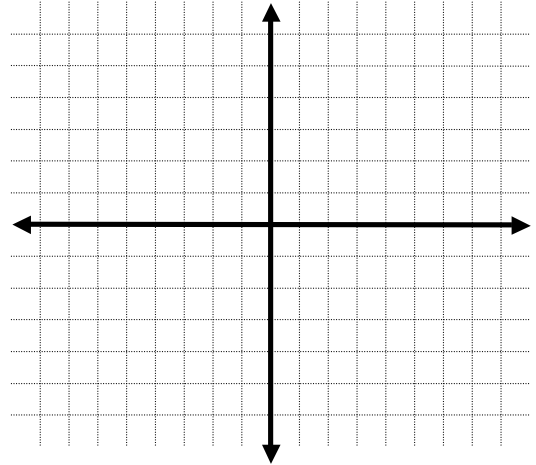


b) Now graph the line.

10. Solve the following system of equations by graphing. Please write your final answer on the space provided.

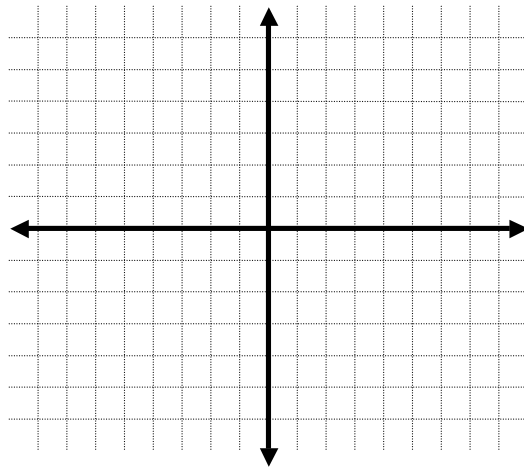
$$\begin{cases} x = 6 + y \\ 2x + y = 0 \end{cases}$$

Answer: _____



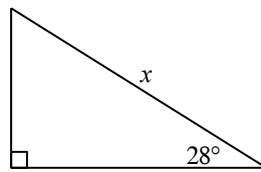
11. Graph the inequality

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

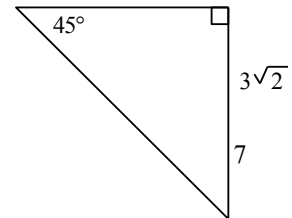


12. The angle of elevation from an observer on the street to the top of a building is 55.6 degrees. If the observer is 150 ft. from the base of the building, how tall is the building, to the nearest hundredth?

13. Solve for x.

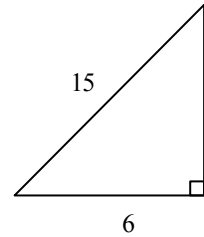


11
Not drawn to scale



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

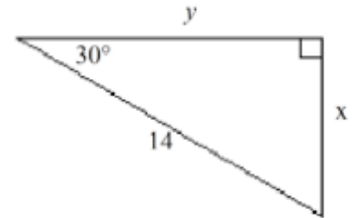
15. Find the length of the missing side in simple radical form:



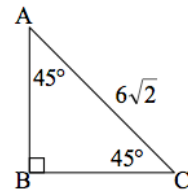
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16. Find x and y . Write your answer in simple radical form.
(Hint: Think “special right triangles”)



17. Find the missing sides: (Hint: Think “special right triangles”)



18. Solve each equation for x :

a) $A = Bxt + C$

b) $\frac{rx + sx}{t} = 1$

c) $\frac{x}{a} = \frac{y}{b}$

d) $\frac{x+2}{y-1} = 2$

19. 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. (Hint: Pythagorean Theorem)