

**SUMMER WORK is due at the beginning of class on the FIRST DAY OF SCHOOL.**

Welcome to **Accelerated Pre-Calculus** at Sandy Creek High School.

I am excited about the upcoming year! In order for us to hit the ground running, I need to ask you to spend some time this summer reviewing math content. Accelerated Pre-Calculus is a course in which the concepts from the beginning lessons build upon one another and are essential to the mastery of the material that will be encountered later in the semester. Your success in class will be the result of the consistency of your study and homework habits. Reviewing class notes each night and diligent homework efforts will greatly enhance your learning process. You are a student whose job and responsibility is to be the best student that you can be!

**When completing this packet, please be sure to show your work.** Be sure to make note of the problems that you have difficulty solving. *I will collect these problems on the first day of school and you will be assessed over this material within the first two weeks of school.*

Start your year off on the right track by completing these problems before school begins. All answers should be written on the answer sheet provided. As you complete this packet, you may want to use a calculator. We will be using graphing calculators in Accelerated Pre-Calculus. If you are looking to purchase a graphing calculator, I recommend a TI-84 or TI-84 Plus.

I am looking forward to working with each of you next year. Please feel free to contact Mrs. Maddox ([maddox.amy@mail.fcboe.org](mailto:maddox.amy@mail.fcboe.org)) if you have any questions or concerns. You can also reach me by text at 770-695-7434 (make sure you state your name in the text).

See you in August! 😊

Mrs. Maddox

Accelerated Pre-Calculus Teacher

1. Completely factor the following expressions:

a.  $9x^2 - 36$

b.  $6x^2 - 21x - 12$

c.  $3x^2 - 2x - 8$

d.  $9x^2 - 24x + 16$

e.  $25x^2 + 60x + 36$

f.  $25x^2 - 49$

2. Simplify the following WITHOUT using a calculator.

a.  $\sqrt{60}$

b.  $\sqrt{23} \cdot \sqrt{23}$

c.  $\sqrt{150}$

3. Identify all real roots of each equation.

a.  $x^3 + 6x^2 - 5x - 30 = 0$

b.  $2x^3 - 42x + 40 = 0$

4. Simplify each of the following WITHOUT using a calculator.

a.  $(-3 + 4i) - (4 - 5i)$

b.  $(1 + 8i)(6 + 2i)$

c.  $(-3 + 3i)(-2 + 2i)$

d.  $\frac{3 + i}{5 - 2i}$

e.  $\frac{-3 + i}{4 - 3i}$

5. A damsel is in distress and is being held captive in a tower. Her knight in shining armor is on the ground below with a ladder. When the knight stands 15 feet from the base of the tower and looks up at his precious damsel, the angle of elevation to her window is 60 degrees. How long does the ladder have to be?

6. Suppose you are flying a kite and it gets caught at the top of the tree. You have let out all 100 feet of string for the kite, and the angle that the string makes with the ground is 75 degrees. How high off of the ground is the kite?

7. Simplify each expression.

a.  $\frac{18x^2 - 3x}{3xy} \cdot \frac{12y^2}{6x - 1}$

b.  $\frac{x^2 - 3x}{14y} \div \frac{2xy}{3y^2}$

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

d.  $\frac{x - 3}{x} + \frac{5}{x^2 - 7x}$

e.  $\frac{4x}{x^2 - 16} - \frac{3}{x + 4}$

f.  $\frac{2x}{x^2 + 5x + 6} - \frac{7x}{x + 2}$

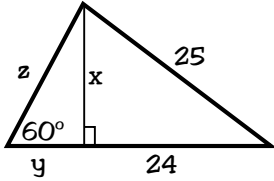
8. Divide using synthetic division.

a.  $2x^4 - 5x^3 + 7x^2 - 3x + 1 \div x - 3$

b.  $9x^3 + 7x^2 - 3x \div x - 10$

9. A building is 60 ft high. From a distance at point A on the ground, the angle of elevation to the top of the building is  $40^\circ$ . At point B, the angle of elevation is  $70^\circ$ . Find the distance from point A to point B.

10. Solve for each variable.



11. A pilot flying at an altitude of 31,000 feet, uses his software to see two airports ahead in the distance. He measures the angle of depression to one airport to be  $53^\circ$  and the angle of depression to the other airport to be  $12^\circ$ . Find the distance (in miles) between the two airports.

12. Solve for  $x$  WITHOUT a calculator.

a.  $3(x+5)^2 - 48 = 0$

b.  $x^2 + 6x - 10 = 0$

c.  $x^2 + 19x + 60 = 0$

13. Find the  $x$  and  $y$  intercepts of the functions. Leave answers in exact form. (NO CALCULATOR)

a.  $f(x) = 2x^2 + 3x - 7$

b.  $f(x) = \frac{7}{3x+4} - 2$

c.  $f(x) = \sqrt{x-11} + 8$

d.  $f(x) = x^2 - 10x + 9$

e.  $f(x) = \log_2(x-5) - 4$

f.  $f(x) = \sqrt{x+6} - 9$

14. Find the domain of each function. Remember... Restrictions come from rational and square root functions. Do not use a calculator for this section.

a.  $f(x) = \sqrt{x-9}$

b.  $f(x) = \frac{x+6}{x^2+5x-6}$

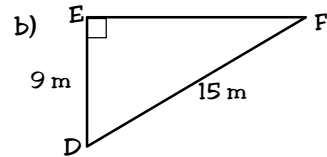
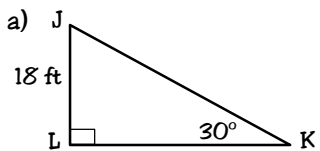
c.  $f(x) = \frac{3x}{\sqrt{x-7}}$

d.  $f(x) = \frac{\sqrt{11-x}}{x+7}$

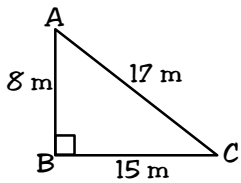
e.  $f(x) = \frac{x-9}{x^2+64}$

f.  $f(x) = \frac{15}{x^2+9x+4}$

15. In the following triangles, find all missing side and all missing angle measures:



16. Triangle ABC is given below. Find the measures of  $\angle A$  and  $\angle C$ . Round to the nearest tenth.



17. Find each variable. If right triangle trig is necessary, you may use a calculator. If not, then you should not. You must be able to work with special rights and the Pythagorean theorem without a calculator.

