

Rising Advanced Algebra Summer Math Packet

Dear Parents,

Rockdale County Public Schools is committed to providing the best math education possible for your child. Due to the cumulative nature of mathematics, in order for your child to be successful in the coming school year, he/she must possess mastery of many concepts from his/her previous math classes. For this reason, we have created a summer math packet to ensure your child is up to date on his/her prerequisite math skills.

1. Complete the practice problems embedded in the summer packet **for the students who will be enrolled in Advanced Algebra during the Fall of 2020**. The use of DESMOS calculator can be found in their ClassLink calculator link on their laptop.



2. Students will submit their answers to the practice problems by clicking a link to a Microsoft Form. Answers will be checked and students will be given automatic feedback to see whether their answer is correct or incorrect.
3. The use of www.khanacademy.org can be helpful for students to use. Type in the learning target topic(s) in the search menu. Here, your son/daughter will find tutorials and extra practice problems. Have him/her watch the tutorials and do the extra practice problems. This website will let your child know if he/she is doing the work correctly.

Rockdale County Public Schools (“District”) is providing links to third-party websites or resources that are not maintained by the District webserver (“External Sites”). If you click the links to the External Sites, then you agree and acknowledge that the District:

1. Has provided these links to External Sites for your convenience only;
2. Has no control over these External Sites;
3. Is not responsible for the availability of these External Sites; and
4. Does not endorse these External Sites and it is not responsible or liable for any content, advertisements, products, or other materials on or made available from these External Sites.

Further, you acknowledge and agree that the District shall not be responsible or liable, either directly or indirectly, for any error, damage or loss caused by or in connection with your use of or reliance on any content, goods, or services available on or through these External Sites.

Week 1

Prerequisite Skill: Operations with Fractions	Learning Targets: <ul style="list-style-type: none">✓ I can simplify fractions.✓ I can perform the four basic operations with fractions.
Practice Problems: Select the best answer choice for each problem. Show your work in the boxes or on a separate sheet of paper.	
1. Simplify the following fraction: (1 Point) $\frac{12}{30}$ <input type="radio"/> $\frac{2}{5}$ <input type="radio"/> $\frac{3}{5}$ <input type="radio"/> $\frac{3}{2}$ <input type="radio"/> $\frac{31}{18}$	2. Simplify the following fraction: (1 Point) $\frac{32}{72}$ <input type="radio"/> $\frac{11}{8}$ <input type="radio"/> $\frac{3}{4}$ <input type="radio"/> $\frac{1}{2}$ <input type="radio"/> $\frac{4}{9}$
3. Add the following fractions: (1 Point) $\frac{2}{3} + \frac{4}{5} =$ <input type="radio"/> $\frac{2}{3}$ <input type="radio"/> $\frac{6}{8}$ <input type="radio"/> $\frac{22}{15}$ <input type="radio"/> $\frac{60}{13}$	4. Subtract the following fractions: (1 Point) $\frac{2}{3} - \frac{5}{9}$ <input type="radio"/> $\frac{19}{9}$ <input type="radio"/> $\frac{1}{9}$ <input type="radio"/> $\frac{7}{3}$ <input type="radio"/> $\frac{13}{16}$

<p>5. Multiply the following fractions: (1 Point)</p> $\frac{3}{7} \times \frac{8}{9}$ <p> <input type="radio"/> $\frac{5}{3}$ <input type="radio"/> $\frac{3}{7}$ <input type="radio"/> $\frac{8}{21}$ <input type="radio"/> $\frac{9}{10}$ </p>	<p>6. Divide the following fractions: (1 Point)</p> $\frac{3}{4} \div \frac{7}{8}$ <p> <input type="radio"/> $\frac{6}{7}$ <input type="radio"/> $\frac{7}{10}$ <input type="radio"/> $\frac{1}{2}$ <input type="radio"/> $\frac{25}{12}$ </p>
--	---

<p>Prerequisite Skill: Solving Two-Step Equations</p>	<p>Learning Targets:</p> <p>✓ I can find the solution(s) that satisfy a two-step equation.</p>
<p>Practice Problems: Select the best answer choice for each problem. Show your work in the boxes or on a separate sheet of paper.</p>	
<p>1. Solve the equation: (1 Point)</p> $5x - 4 = 11$ <p> <input type="radio"/> $x = 3$ <input type="radio"/> $x = 9$ <input type="radio"/> $x = 6$ <input type="radio"/> $x = 1$ </p>	<p>2. Solve the equation: (1 Point)</p> $-2x + 5 = 17$ <p> <input type="radio"/> $x = -13$ <input type="radio"/> $x = -2$ <input type="radio"/> $x = -6$ <input type="radio"/> $x = -7$ </p>
<p>3. Solve the equation: (1 Point)</p> $8 - 24x = 20$ <p> <input type="radio"/> $x = -2$ <input type="radio"/> $x = -\frac{1}{2}$ <input type="radio"/> $x = -\frac{11}{19}$ <input type="radio"/> $x = 0$ </p>	<p>4. Solve the equation: (1 Point)</p> $\frac{7}{3}x = 21$ <p> <input type="radio"/> $x = 9$ <input type="radio"/> $x = 2$ <input type="radio"/> $x = 26$ <input type="radio"/> $x = 10$ </p>

5. Which of the following equations have the solution $x = -3$?

(1 Point)

☐ $2x - 4 = 6$

☐ $-5 + 3x = 4$

☐ $8x + 7 = 31$

☐ $9 - 2x = 15$

Week 2

Prerequisite Skill: Factoring Trinomials

Learning Targets:

- ✓ I can factor polynomials in standard form ($ax^2 + bx + c$).
- ✓ I can explain how factoring and distribution are related.

Practice Problems: Select the best answer choice for each problem. Show your work in the boxes or on a separate sheet of paper.

1. Factor. *

(1 Point)

$$x^2 - 14x + 49$$

- ☐ $(x + 7)^2$
- ☐ $(x - 7)^2$
- ☐ $(x - 7)(x + 7)$
- ☐ $(x - 49)(x - 1)$

2. Once factored completely, what is the expression below equivalent to?

(1 Point)

$$2y^2 + 12y - 54$$

- ☐ $2(y - 3)(y + 9)$
- ☐ $2(y - 3)(y - 9)$
- ☐ $(y + 6)(2y - 9)$
- ☐ $(2y + 6)(y - 9)$

3. What are the factors of the quadratic expression below?

(1 Point)

$$x^2 - 2x - 24$$

- ☐ $(x + 6)(x - 4)$
- ☐ $(x - 12)(x + 2)$
- ☐ $(x + 12)(x - 2)$
- ☐ $(x - 6)(x + 4)$

4. Factor the following polynomial.

(1 Point)

$$3x^2 + 7x - 6$$

☐ $(3x - 2)(x - 3)$

☐ $(x + 3)(3x + 2)$

☐ $(3x - 2)(x + 3)$

☐ $(3x + 2)(x - 3)$

5. Complete. *

(1 Point)

$$y^2 - 2y - 48 = (y - 8)(y + ?)$$

☐ 24

☐ -40

☐ 6

☐ -6

6. Which of the expressions below is a binomial factor of the polynomial shown?

(1 Point)

$$y^2 + 10y - 24$$

☐ $y + 4$

☐ $y - 12$

☐ $y - 4$

☐ $y + 12$

Prerequisite Skill: Solving Quadratics by Factoring	Learning Targets: ✓ I can use factoring as a method to solve quadratic equations.
Practice Problems: Select the best answer choice for each problem. Show your work in the boxes or on a separate sheet of paper.	
1. Solve the following quadratic equation by Factoring: (1 Point) $x^2 - 9x + 18 = 0$ <input type="radio"/> $x = 3; x = 6$ <input type="radio"/> $x = 8; x = 11$ <input type="radio"/> $x = 5; x = 14$ <input type="radio"/> $x = 8; x = 5$	2. Solve the following quadratic equation by Factoring: (1 Point) $x^2 + 5x + 4 = 0$ <input type="radio"/> $x = -12; x = -3$ <input type="radio"/> $x = -9; x = -2$ <input type="radio"/> $x = -4; x = -1$ <input type="radio"/> $x = -2; x = -1$
3. Solve the following quadratic equation by Factoring: (1 Point) $3k^2 - 14k - 49 = 0$ <input type="radio"/> $k = -17; k = 4$ <input type="radio"/> $k = -11; k = \frac{34}{7}$ <input type="radio"/> $k = 7; k = -\frac{7}{3}$ <input type="radio"/> $k = -4; k = \frac{111}{19}$	4. Solve the following quadratic equation by Factoring: (1 Point) $2x^2 + 3x - 14 = 0$ <input type="radio"/> $x = -11; x = 6$ <input type="radio"/> $x = -\frac{47}{16}; x = 4$ <input type="radio"/> $x = -6; x = 2$ <input type="radio"/> $x = -\frac{7}{2}; x = 2$
5. Solve the following quadratic equation by Factoring: (1 Point) $x^2 + 2x - 15 = 0$ <input type="radio"/> $x = 3, x = 5$ <input type="radio"/> $x = 5, x = -3$ <input type="radio"/> $x = -5, x = 3$ <input type="radio"/> $x = -3, x = -5$	6. Solve the following equation by Factoring: (1 Point) $4x^2 + 11x - 3 = 0$ <input type="radio"/> $x = -\frac{3}{4}; x = -1$ <input type="radio"/> $x = \frac{1}{4}; x = -3$ <input type="radio"/> $x = 4; x = 3$ <input type="radio"/> $x = -\frac{1}{4}; x = 3$

Week 3

Prerequisite Skill: Simplifying Radicals (using square and cube roots)	Learning Targets: <ul style="list-style-type: none">✓ I can find the square root of a number.✓ I can break down a radical to find its square root.✓ I can find the cube root of a number.
Practice Problems: Select the best answer choice for each problem. Show your work in the boxes or on a separate sheet of paper.	
1. Simplify the following radical: (1 Point) $\sqrt{196}$ <input type="radio"/> 14 <input type="radio"/> $16\sqrt{2}$ <input type="radio"/> 6 <input type="radio"/> $3\sqrt{3}$	2. Simplify the following radical: (1 Point) $\sqrt{108}$ <input type="radio"/> $16\sqrt{2}$ <input type="radio"/> 12 <input type="radio"/> $4\sqrt{5}$ <input type="radio"/> $6\sqrt{3}$
3. Simplify the following radical: (1 Point) $\sqrt[3]{729}$ <input type="radio"/> $6\sqrt[3]{3}$ <input type="radio"/> 9 <input type="radio"/> $\sqrt[3]{9}$ <input type="radio"/> 7	4. Simplify the following radical: (1 Point) $\sqrt{24}$ <input type="radio"/> $\sqrt{4}$ <input type="radio"/> $4\sqrt{6}$ <input type="radio"/> $2\sqrt{12}$ <input type="radio"/> $2\sqrt{6}$
5. Simplify the following radical: (1 Point) $\sqrt{\frac{8}{11}}$ <input type="radio"/> $\frac{2\sqrt{22}}{11}$ <input type="radio"/> $\frac{\sqrt{47}}{25}$ <input type="radio"/> $\frac{3\sqrt{46}}{4}$ <input type="radio"/> $\frac{4\sqrt{43}}{17}$	

Prerequisite Skill: Solving Quadratics by Taking Square Roots	Learning Targets: ✓ I can solve quadratic equations using the square root method.
Practice Problems: Select the best answer choice for each problem. Show your work in the boxes or on a separate sheet of paper.	
1. Solve the following equation by taking square roots: (1 Point) $x^2 - 81 = 0$ <input type="radio"/> $x = 9; x = -9$ <input type="radio"/> $x = 15; x = -19$ <input type="radio"/> $x = 12; x = -12$ <input type="radio"/> $x = 15; x = -23$	2. Solve the following equation by taking square roots: (1 Point) $x^2 - 50 = 0$ <input type="radio"/> $x = 2\sqrt{3}; x = -13\sqrt{2}$ <input type="radio"/> $x = 3\sqrt{4}; x = -10\sqrt{5}$ <input type="radio"/> $x = 5\sqrt{2}; x = -5\sqrt{2}$ <input type="radio"/> $x = 7\sqrt{1}; x = -10\sqrt{3}$
3. Solve the following equation by taking square roots: (1 Point) $4a^2 - 9 = 3$ <input type="radio"/> $a = \sqrt{1}; a = -\sqrt{1}$ <input type="radio"/> $a = \sqrt{3}; a = -\sqrt{3}$ <input type="radio"/> $a = \sqrt{5}; a = -\sqrt{2}$ <input type="radio"/> $a = \sqrt{6}; a = -\sqrt{2}$	4. Solve the following equation by taking square roots: (1 Point) $(2y - 3)^2 = 25$ <input type="radio"/> $y = 1; y = -3$ <input type="radio"/> $y = 1; y = -1$ <input type="radio"/> $y = 4; y = -1$ <input type="radio"/> $y = 9; y = -3$
5. Solve the following equation by taking square roots: (1 Point) $(x + 1)^2 - 8 = 0$ <input type="radio"/> $x = -3 + \sqrt{6}; x = -3 - \sqrt{6}$ <input type="radio"/> $x = -3 + \sqrt{3}; x = -3 - \sqrt{3}$ <input type="radio"/> $x = -3 + \sqrt{4}; x = -3 - \sqrt{4}$ <input type="radio"/> $x = -1 + 2\sqrt{2}; x = -1 - 2\sqrt{2}$	6. Solve the following equation by taking square roots: (1 Point) $3(x + 3)^2 - 30 = -3$ <input type="radio"/> $x = -5; x = -15$ <input type="radio"/> $x = -4; x = -17$ <input type="radio"/> $x = 0; x = -6$ <input type="radio"/> $x = 2; x = -2$

Week 4

Prerequisite Skill: Solving Quadratics by Completing the Square

Learning Targets:

✓ I can solve quadratic equations by completing the square.

Practice Problems: Select the best answer choice for each problem. Show your work in the boxes or on a separate sheet of paper.

1. Solve the following quadratic equation by completing the square:

(1 Point)

$$a^2 + 14a - 51 = 0$$

☐ $a = -40; a = 1$

☐ $a = -35; a = 4$

☐ $a = -17; a = 3$

☐ $a = -5; a = 9$

2. Solve the following quadratic equation by completing the square:

(1 Point)

$$a^2 + 8a - 80 = 0$$

☐ $a = -12 + \sqrt{3}; a = -12 - \sqrt{3}$

☐ $a = -10 + \sqrt{3} - 10; a = -10 - \sqrt{3}$

☐ $a = -6 + \sqrt{11}; a = -6 - \sqrt{11}$

☐ $a = -4 + 4\sqrt{6}; a = -4 - 4\sqrt{6}$

3. Solve the following quadratic equation by completing the square:

(1 Point)

$$x^2 - 10x + 26 = 8$$

☐ $x = 4 + \sqrt{21}; x = 4 - \sqrt{21}$

☐ $x = 5 + \sqrt{7}; x = 5 - \sqrt{7}$

☐ $x = 6 + \sqrt{5}; x = 6 - \sqrt{5}$

☐ $x = 13 + \sqrt{14} + 1; x = 13 - \sqrt{14}$

4. Solve the following quadratic equation by completing the square:

(1 Point)

$$r^2 - 4r - 91 = 7$$

☐ $r = 1 + \sqrt{98}; r = 1 - \sqrt{98}$

☐ $r = 2 + \sqrt{102}; r = 2 - \sqrt{102}$

☐ $r = 3 + \sqrt{279}; r = 3 - \sqrt{279}$

☐ $r = 5 + \sqrt{293}; r = 5 - \sqrt{293}$

5. Solve the following quadratic equation by completing the square:

(1 Point)

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

☐

☐ $x = \frac{2}{3}; x = 2$

☐ $x = \frac{9}{7}; x = 5$

☐ $x = 0; x = 1$

☐ $x = \frac{31}{18}; x = 5$

Prerequisite Skill: Solving Quadratics by using the Quadratic Formula

Learning Targets:

✓ I can use the quadratic formula to solve quadratic equations.

Practice Problems: Select the best answer choice for each problem. Show your work in the boxes or on a separate sheet of paper.

1. Solve the following quadratic equation using the quadratic formula:

(1 Point)

$$3n^2 - 5n - 8 = 0$$

☐ $n = -2; n = \frac{76}{15}$

☐ $n = -2; n = \frac{58}{17}$

☐ $n = -2; n = \frac{11}{3}$

☐ $n = -1; n = \frac{8}{3}$

2. Solve the following quadratic equation using the quadratic formula:

(1 Point)

$$n^2 - 8n - 6 = 0$$

☐ $n = 1 + \sqrt{6}; n = 1 - \sqrt{6}$

☐ $n = 4 + \sqrt{22}; n = 4 - \sqrt{22}$

☐ $n = 1 + \sqrt{15}; n = 1 - \sqrt{15}$

☐ $n = 10 + \sqrt{21}; n = 10 - \sqrt{21}$

3. Solve the following quadratic equation using the quadratic formula:

(1 Point)

$$x^2 + 10x + 21 = 0$$

☐ $x = -7; x = -3$

☐ $x = -3; x = -7$

☐ $x = -6; x = -6$

☐ $x = -21; x = -3$

4. Solve the following quadratic equation using the quadratic formula:

(1 Point)

$$8x^2 - 14 = -11$$

☐ $x = \frac{\sqrt{6}}{4}; x = -\frac{\sqrt{6}}{4}$

☐ $x = \frac{\sqrt{3}}{9}; x = -\frac{\sqrt{3}}{9}$

☐ $x = \frac{\sqrt{17}}{4}; x = -\frac{\sqrt{17}}{4}$

☐ $x = \frac{\sqrt{7}}{4}; x = -\frac{\sqrt{7}}{4}$

5. Solve the following quadratic equation using the quadratic formula:

(1 Point)

$$3x^2 = -7x + 136$$

☐ $x = -7; x = \frac{230}{17}$

☐ $x = -11; x = \frac{294}{19}$

☐ $x = -8; x = \frac{17}{3}$

☐ $x = -15; x = \frac{15}{4}$

Week 5

Prerequisite Skill: Adding and Subtracting Polynomials	Learning Targets: ✓ I can add polynomials. ✓ I can subtract polynomials.
Practice Problems: Select the best answer choice for each problem. Show your work in the boxes or on a separate sheet of paper.	
<p>1. Add the polynomials: * (1 Point)</p> $(4 + 2x^3 + 3x^4) + (5 + 2x^4 + 4x^3)$ <p> <input type="radio"/> $5x^4 + 6x^3 + 9$ <input type="radio"/> $5x^4 + 9x^3 + 9$ <input type="radio"/> $9x^3 + 9$ <input type="radio"/> $9x^3 + 5x^2 + 9$ </p>	<p>2. Add the two polynomials: * (1 Point)</p> $(5m^3 + 8 + m) + (7m - 7m^3 + 8)$ <p> <input type="radio"/> $16 + 9m$ <input type="radio"/> $-2m^3 + 8m + 16$ <input type="radio"/> $2m^3 + 9m + 16$ <input type="radio"/> $-2m^3 + 9m + 16$ </p>
<p>3. Add the two polynomials: * (1 Point)</p> $(8k^2 - 1 + 2k^4) + (2k^3 - 3 + k^2)$ <p> <input type="radio"/> $2k^4 + 2k^3 + 9k^2 - 4$ <input type="radio"/> $2k^4 + 5k^3 + 9k^2 - 4$ <input type="radio"/> $-3k^4 + 5k^3 + 14k^2 - 4$ <input type="radio"/> $2k^4 + 5k^3 + 14k^2 - 4$ </p>	<p>4. Subtract the two polynomials: (1 Point)</p> $(3p^4 + 8p - 7) - (6 + 6p + 7p^2)$ <p> <input type="radio"/> $3p^4 - 7p^2 + 2p - 3$ <input type="radio"/> $3p^4 - 7p^2 + 2p - 5$ <input type="radio"/> $3p^4 - 7p^2 + 2p - 13$ <input type="radio"/> $3p^4 - 9p^2 + 2p - 3$ </p>

5. Subtract the two polynomials: *

(1 Point)

$$(5a - 5a^2 - 7a^4) - (5a^2 - 8a + 8a^4)$$

☐ $-15a^4 - 6a^2 + 13a$

☐ $-15a^4 - 6a^2 + 18a$

☐ $-15a^4 - 14a^2 + 13a$

☐ $-15a^4 - 10a^2 + 13a$

6. Subtract the two polynomials:

(1 Point)

$$(8x^4 - 8 - 8x^2) - (x^2 - 2x^4 + x)$$

☐ $8x^4 - 9x^2 + 2x - 8$

☐ $10x^4 - 9x^2 + 2x - 8$

☐ $8x^4 - 9x^2 - 6x - 8$

☐ $10x^4 - 9x^2 - x - 8$

Prerequisite Skill: Multiplying Polynomials	Learning Targets: ✓ I can multiply polynomials.
Practice Problems: Select the best answer choice for each problem. Show your work in the boxes or on a separate sheet of paper.	
1. Find the product: (1 Point) $3r^2(2r - 3)$ <input type="radio"/> $56r^2 - 16r$ <input type="radio"/> $6r^3 - 9r^2$ <input type="radio"/> $12r - 6$ <input type="radio"/> $49r + 28$	2. Find the product: * (1 Point) $4n(2n^2 + n - 1)$ <input type="radio"/> $8n^3 + 4n^2 - 4n$ <input type="radio"/> $4n^2 - 10n - 2$ <input type="radio"/> $30n^2 + 5n - 30$ <input type="radio"/> $16n^3 + 6n^2 + 12n$
3. Multiply the two binomials: (1 Point) $(5n - 5)(2n - 6)$ <input type="radio"/> $10n^2 + 20n - 30$ <input type="radio"/> $10n^2 - 20n - 30$ <input type="radio"/> $10n^2 + 30$ <input type="radio"/> $10n^2 - 40n + 30$	4. Multiply the two binomials: (1 Point) $(5p + 8)(-3p + 1)$ <input type="radio"/> $9p^2 + 12p - 5$ <input type="radio"/> $9p^2 + 18p - 5$ <input type="radio"/> $16p^2 + 42p + 5$ <input type="radio"/> $-15p^2 - 19p + 8$
5. Multiply the two binomials: (1 Point) $(-3n + 4)(-3n + 6)$ <input type="radio"/> $9n^2 + 24$ <input type="radio"/> $9n^2 - 6n - 24$ <input type="radio"/> $9n^2 + 6n - 24$ <input type="radio"/> $9n^2 - 30n + 24$	6. Multiply the two binomials: (1 Point) $(-8a - 4)(6a + 4)$ <input type="radio"/> $-48a^2 - 16$ <input type="radio"/> $-48a^2 - 8a + 16$ <input type="radio"/> $-48a^2 - 56a - 16$ <input type="radio"/> $-48a^2 + 8a + 16$