

# Algebra 3/ Trig Summer Packet



Dear Student,

Welcome to Sayreville War Memorial High School and your math course for the year! There is much to learn this year, and each class session during school will require students to work diligently, both during and outside of class. This summer Math packet addresses the material that you should be comfortable with before the start of Algebra 3/ Trig. This Math packet serves 2 purposes:

- 1) It will allow you to remain mathematically fresh during the summer and
- 2) It will enable you to “hit the ground running” when this course begins.

**This packet should be completed and brought with you on the first day of school. Use the answer key provided to check your work. If you come across questions that you are unsure of, make note and bring that up to your teacher during the review.** It would be a mistake to complete this packet immediately upon the completion of this past school year as well as waiting until just before the next school year begins. Take some time off and look towards beginning the packet come mid-summer. It is important that the techniques practiced in this packet are fresh in your mind come the first day of school.

**You will be assessed on this content within the first week or so of school.**

Good luck!

Name: \_\_\_\_\_

### SOLVING EQUATIONS CONTAINING ALGEBRAIC FRACTIONS

Fractions that appear in algebraic equations can usually be eliminated in one step by multiplying each term on both sides of the equation by the common denominator for all of the fractions. If you cannot determine the common denominator, use the product of all the denominators. Multiply, simplify each term as usual, then solve the remaining equation.

#### Example 1

Solve for x:  $\frac{x}{9} + \frac{2x}{5} = 3$

$$45\left(\frac{x}{9} + \frac{2x}{5}\right) = 45(3)$$

$$45\left(\frac{x}{9}\right) + 45\left(\frac{2x}{5}\right) = 135$$

$$5x + 18x = 135$$

$$23x = 135$$

$$x = \frac{135}{23}$$

#### Example 2

Solve for x:  $\frac{5}{2x} + \frac{1}{6} = 8$

$$6x\left(\frac{5}{2x} + \frac{1}{6}\right) = 6x(8)$$

$$6x\left(\frac{5}{2x}\right) + 6x\left(\frac{1}{6}\right) = 48x$$

$$15 + x = 48x$$

$$15 = 47x$$

$$x = \frac{15}{47}$$

Solve the following equations using the fraction busters method.

1.  $\frac{x}{6} + \frac{2x}{3} = 5$

2.  $\frac{x}{3} + \frac{x}{2} = 1$

3.  $\frac{16}{x} + \frac{16}{40} = 1$

4.  $\frac{5}{x} + \frac{5}{3x} = 1$

5.  $\frac{x}{2} - \frac{x}{5} = 9$

6.  $\frac{x}{3} - \frac{x}{5} = \frac{2}{3}$

7.  $\frac{x}{2} - 4 = \frac{x}{3}$

8.  $\frac{x}{8} = \frac{x}{12} + \frac{1}{3}$

9.  $5 - \frac{7x}{6} = \frac{3}{2}$

10.  $\frac{2x}{3} - x = 4$

11.  $\frac{x}{8} = \frac{x}{5} - \frac{1}{3}$

12.  $\frac{2x}{3} - \frac{3x}{5} = 2$

13.  $\frac{4}{x} + \frac{2}{x} = 1$

14.  $\frac{3}{x} + 2 = 4$

15.  $\frac{5}{x} + 6 = \frac{17}{x}$

16.  $\frac{2}{x} - \frac{4}{3x} = \frac{2}{9}$

17.  $\frac{x+2}{3} + \frac{x-1}{6} = 5$

18.  $\frac{x}{4} + \frac{x+5}{3} = 4$

19.  $\frac{x-1}{2x} + \frac{x+3}{4x} = \frac{5}{8}$

20.  $\frac{2-x}{x} - \frac{x+3}{3x} = \frac{-1}{3}$

Solving Inequalities with variable on both sides.

Solve each inequality and graph its solution.

1)  $4 + 6x \leq x + 6x$

2)  $m + 16 > 8m + 2$

3)  $2r - 5 > 2r - 5$

4)  $5x - 1 \geq 13 - 2x$

5)  $6 - 4n < -1 - 4n$

6)  $-7n + 3n > -9 - 7n$

7)  $1 + 2m \geq 8 + m$

8)  $p - 1 > 13 + 3p$

9)  $7b + 3b > -8 + 6b$

10)  $2b - 7 \geq -14 + 2b$

11)  $-3k - 2 \geq -k + 10$

12)  $-8x - 3 > -3 - 8x$

13)  $7 + 6x \geq 7x + 6x$

14)  $-15 + 8x > 8x - 3x$

15)  $-15 - 2n > -8n + n$

## Rationalizing Denominators Worksheet

Rationalize each denominator. When possible, simplify by reducing the resulting fraction.

Ex..  $\frac{1}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{2}}{\sqrt{4}} = \frac{\sqrt{2}}{2}$

2.  $\frac{2}{\sqrt{3}}$

3.  $\frac{1}{\sqrt{7}}$

4.  $\frac{6}{\sqrt{2}}$

5.  $\frac{15}{\sqrt{5}}$

6.  $\frac{42}{\sqrt{7}}$

7.  $\frac{1}{\sqrt{81}}$

8.  $\frac{2}{\sqrt{11}}$

9.  $\frac{4}{\sqrt{2}}$

10.  $\frac{1}{\sqrt{3}}$

11.  $\frac{1}{\sqrt{225}}$

12.  $\frac{1}{3\sqrt{16}}$

## Simplifying Radical Expressions

Simplify.

1)  $\sqrt{125n}$

2)  $\sqrt{216v}$

3)  $\sqrt{512k^2}$

4)  $\sqrt{512m^3}$

5)  $\sqrt{216k^4}$

6)  $\sqrt{100v^3}$

7)  $\sqrt{80p^3}$

8)  $\sqrt{45p^2}$

9)  $\sqrt{147m^3n^3}$

10)  $\sqrt{200m^4n}$

11)  $\sqrt{75x^2y}$

12)  $\sqrt{64m^3n^3}$

13)  $\sqrt{16u^4v^3}$

14)  $\sqrt{28x^3y^3}$

LAWS OF EXPONENTS WORKSHEET

Simplify. Write answers with positive exponents.

1)  $15^{-4}(15^8)$

2)  $a^7(a^8)(a)$

3)  $(3m^4n^6)(2mn)^0(2m^2n)$

4)  $\frac{-28a^6b^{-3}c^5}{7a^{11}b^{-5}c^5}$

5)  $(-1x^5y^6)^{10}$

6)  $\frac{(-2ab^7)^3}{(-a^4b^2)^5}$

7)  $\frac{2x^4y^3}{(3z^{-3})^2} \cdot \frac{(3z^7)^2}{2xy^6}$

8)  $(5m^3n)(-2mn^3)$

9)  $(7ab)(-a^4b^3)^2(2a^5b^6)^{-1}$

10)  $(-9x^3y^4)(1/3x^5)(-2y^2)$

SOLUTIONS BELOW

1)  $15^4$

2)  $a^{16}$

3)  $6m^6n^7$

4)  $\frac{-4b^2}{a^5}$

5)  $x^{50}y^{60}$

6)  $\frac{8b^{11}}{a^{17}}$

7)  $\frac{2x^3z^{20}}{y^3}$

8)  $-10m^4n^4$

9)  $\frac{7a^4b}{2}$

10)  $6x^8y^6$