

## **GSMST MATHEMATICS INFORMATION 2018**

### **GSMST Mathematics Students should know the following:**

Whether you are taking Accelerated Algebra, Accelerated Geometry or Accelerated Precalculus as a freshmen, the following math topics are very important. Please look at these resources and work through quizzes/ worksheets as needed. These items you will be expected to have a full grasp on as you move forward in math and science here at GSMST.

Also, please see the attached Common Algebra Errors sheet, as these are the common mistakes made by students.

1. Fractions. Resource: <https://www.mathsisfun.com/fractions-menu.html>
2. Properties of exponents. Resource: <https://www.mathsisfun.com/algebra/exponent-laws.html>
3. Functions, vertical line test. Resource: <https://www.mathsisfun.com/sets/function.html>
4. Linear equations and graphs. Resource: <https://www.mathsisfun.com/algebra/linear-equations.html>
5. Factoring (specifically quadratics) - By grouping, substitution, AC method (or other facsimile). <https://www.mathsisfun.com/algebra/factoring-quadratics.html>
6. Order of operations-PEMDAS. <https://www.mathsisfun.com/operation-order-pemdas.html>
7. Right Triangle Trigonometry- SOHCAHTOA-<https://www.mathsisfun.com/sine-cosine-tangent.html>

Looking forward to a great school year!

GSMST MATH DEPARTMENT

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## Common Algebraic Errors

Error	Reason/Correct/Justification/Example
$\frac{2}{0} \neq 0$ and $\frac{2}{0} \neq 2$	Division by zero is undefined!
$-3^2 \neq 9$	$-3^2 = -9$ , $(-3)^2 = 9$ Watch parenthesis!
$(x^2)^3 \neq x^5$	$(x^2)^3 = x^2 x^2 x^2 = x^6$
$\frac{a}{b+c} \neq \frac{a}{b} + \frac{a}{c}$	$\frac{1}{2} = \frac{1}{1+1} \neq \frac{1}{1} + \frac{1}{1} = 2$
$\frac{1}{x^2+x^3} \neq x^{-2} + x^{-3}$	A more complex version of the previous error.
$\frac{\cancel{a}+bx}{\cancel{a}} \neq 1+bx$	$\frac{a+bx}{a} = \frac{a}{a} + \frac{bx}{a} = 1 + \frac{bx}{a}$ Beware of incorrect canceling!
$-a(x-1) \neq -ax-a$	$-a(x-1) = -ax+a$ Make sure you distribute the “-“!
$(x+a)^2 \neq x^2+a^2$	$(x+a)^2 = (x+a)(x+a) = x^2+2ax+a^2$
$\sqrt{x^2+a^2} \neq x+a$	$5 = \sqrt{25} = \sqrt{3^2+4^2} \neq \sqrt{3^2} + \sqrt{4^2} = 3+4=7$
$\sqrt{x+a} \neq \sqrt{x} + \sqrt{a}$	See previous error.
$(x+a)^n \neq x^n+a^n$ and $\sqrt[n]{x+a} \neq \sqrt[n]{x} + \sqrt[n]{a}$	More general versions of previous three errors.
$2(x+1)^2 \neq (2x+2)^2$	$2(x+1)^2 = 2(x^2+2x+1) = 2x^2+4x+2$ $(2x+2)^2 = 4x^2+8x+4$ Square first then distribute!
$(2x+2)^2 \neq 2(x+1)^2$	See the previous example. You can not factor out a constant if there is a power on the parenthesis!
$\sqrt{-x^2+a^2} \neq -\sqrt{x^2+a^2}$	$\sqrt{-x^2+a^2} = (-x^2+a^2)^{\frac{1}{2}}$ Now see the previous error.
$\frac{a}{\left(\frac{b}{c}\right)} \neq \frac{ab}{c}$	$\frac{a}{\left(\frac{b}{c}\right)} = \frac{\left(\frac{a}{1}\right)}{\left(\frac{b}{c}\right)} = \left(\frac{a}{1}\right)\left(\frac{c}{b}\right) = \frac{ac}{b}$
$\frac{\left(\frac{a}{b}\right)}{c} \neq \frac{ac}{b}$	$\frac{\left(\frac{a}{b}\right)}{c} = \frac{\left(\frac{a}{b}\right)}{\left(\frac{c}{1}\right)} = \left(\frac{a}{b}\right)\left(\frac{1}{c}\right) = \frac{a}{bc}$