Appendix E: K-12 Formulas

K-12 Formulas

The following formulas are provided for teachers and are not intended to comprise a comprehensive formula list for students. The formulas defined in the table below pertain to the Florida's B.E.S.T. Standards for Mathematics for Grades K-12.

Area of a two-dimensional figure	
Rectangle	$A = lw$, where l is the length and w is the width $A = bh$, where b is the base and h is the height
Square	$A = lw$, where l is the length and w is the width $A = bh$, where b is the base and h is the height $A = s^2$, where s is the side length
Triangle	$A = \frac{1}{2}bh$, where b is the base and h is the height
Trapezoid	$A = \frac{1}{2}(b_1 + b_2)h$, where b_1 and b_2 are the bases and h is the height
Parallelogram	$A = bh$, where b is the base and h is the height
Rhombus	$A = bh$, where b is the base and h is the height $A = \frac{1}{2}d_1d_2$, where d_1 and d_2 are the diagonals
Circle	$A = \pi r^2$, where r is the radius
Equilateral triangle	$A = \frac{\sqrt{3}}{4}s^2$, where s is the side length
Regular Polygon	$A = \frac{1}{2}Pa$, where P is the perimeter and a is the apothem

Surface Area of a three-dimensional figure	
Cube	$SA = 6s^2$, where s is the side length
Prism	$SA = 2B + Ph$, where B is the area of the base, P is the perimeter of the base and h is the height
Cylinder	$SA = 2B + Ph$, where B is the area of the base, P is the perimeter of the base and h is the height
Cone	$SA = B + \pi rh_s$, where B is the area of the base, r is the radius and h_s is the slant height
Pyramid	$SA = B + A(each\ face)$, where B is the area of the base and A(each face) is the area of each face
Regular pyramid	$SA = B + \frac{1}{2}Ph_s$, where B is the area of the base, P is the perimeter of the base and h_s is the slant height
Sphere	$SA = 4\pi r^2$, where r is the radius
Hemisphere	$SA = 3\pi r^2$, where r is the radius and the area of the flat side is included

Volume of a three-dimensional figure	
Cube	$V = s^3$, where s is the side length
Prism	$V = Bh$, where B is the area of the base and h is the height
Cylinder	$V = Bh$, where B is the area of the base and h is the height
Cone	$V = \frac{1}{3}Bh$, where B is the area of the base and h is the height
Pyramid	$V = \frac{1}{3}Bh$, where B is the area of the base and h is the height
Sphere	$V = \frac{4}{3}\pi r^3$, where r is the radius

Laws of Exponents (where m and n are integers and a and b are nonzero real numbers)	
Product of powers	$a^m \cdot a^n = a^{m+n}$ and conversely $a^{m+n} = a^m \cdot a^n$
Quotient of powers	$\frac{a^m}{a^n} = a^{m-n}$ and conversely $a^{m-n} = \frac{a^m}{a^n}$
Power of a power	$(a^m)^n = a^{m \cdot n}$ and conversely $a^{m \cdot n} = (a^m)^n$
Power of a product	$(ab)^m = a^m \cdot b^m$ and conversely $a^m \cdot b^m = (ab)^m$
Power of a quotient	$\left(\frac{a}{b}\right)^m = \frac{a^m}{b^m}$ and conversely $\frac{a^m}{b^m} = \left(\frac{a}{b}\right)^m$
Negative exponent	$a^{-1} = \frac{1}{a}$ and conversely $\frac{1}{a} = a^{-1}$ $\left(\frac{a}{b}\right)^{-1} = \frac{b}{a}$ and conversely $\frac{b}{a} = \left(\frac{a}{b}\right)^{-1}$
Identity exponent	$a^1 = a$
Zero exponent	$a^0 = 1$
Rational, Fractional exponent	$a^{\frac{m}{n}} = \left(\sqrt[n]{a}\right)^m$ and conversely $\left(\sqrt[n]{a}\right)^m = a^{\frac{m}{n}}$, where $a > 0$ $a^{\frac{m}{n}} = \sqrt[n]{(a^m)}$ and conversely $\sqrt[n]{(a^m)} = a^{\frac{m}{n}}$, where $a > 0$