Algebra I SOL Topics and Formulas

SOL 1: Equations, Inequalities, Expressions

Use Opposite operation Inverse

Divide/Multiply by a negative switch the symbols**

$-2x \geq 14$

$\frac{-2x}{-2x} \geq \frac{14}{-2}$

$x \leq -7$

SOL 2: Verbal Expressions

Oder of Operations PEMDAS

Two less than x = x-2

SOL 3: Properties

Distributive	$x(2+y) = 2x + xy$
Identity	$2x \bullet 1 = 2x$
Commutative	$a+b+c = c+b+a$
Associative	$(a+b)+c = a+(b+c)$
Reflexive	$a+b = a+b$
Symmetric	If $a = b$, then $b = a$
Transitive	If $a = b$, and $b = c$, then $a = c$

SOL 4: Matrices

Rows x Columns

Add, Subtract, Multiply

$$\begin{pmatrix} 5 & 7 \\ 10 & -12 \end{pmatrix} + \begin{pmatrix} 3 & 6 \\ 3 & 4 \end{pmatrix} = \begin{pmatrix} 8 & 13 \\ 13 & -8 \end{pmatrix}$$

$$5\begin{pmatrix} 2 & 10 \\ 4 & -4 \end{pmatrix} = \begin{pmatrix} 10 & 50 \\ 20 & -20 \end{pmatrix}$$

SOL 5: Function, Patterns

Function: x does not repeat domain is all different #

Graphs use vertical line test can only crass at one point

SOL 6: Slop, X, Y, Intercepts

y=mx+b m=slope b=y-intercept

Ax + By = C standard form

Slope= $\frac{y_1 - y_2}{x_1 - x_2}$

Horizontal line y=2 slope = 0

Vertical line x=2 slope is undefined

SOL 7: Slope, Graph of a line

Types of slope:

Positive

Negative

Zero - HOY

Undefined - VUX

SOL 8: Write Linear Equations

Y=mx+b slope intercept

Ax+By=C Standard

Determine slope: $\frac{rise}{run}$

SOL 9: Systems o Equations: 2 equations, 2 variables, 2 answers

Elimination

$$\begin{array}{r} x+2y=6 \\ -x+y=9 \\ \hline 3y=15 \\ y=5 \end{array}$$

**now plug y=5 into either equation

$$\begin{array}{l} -x+5=9 \\ -x=4 \\ x=-4 \end{array}$$

Substitution

$$\begin{array}{l} x=y+5 \\ 2x+7y=7 \\ 2(y+5)+7y=7 \\ 2y+10+7y=7 \\ 9y=-3 \\ y=\frac{-1}{3} \end{array}$$

Graphing- when 2 lines intersect is the solution (x,y)

SOL 10: Monomials, Exponents, Scientific Notation

A. Add exponents $(2x^2y^3)(5xy^4)=10x^3y^7$

B. Multiply Exponents $(3x^2y^3)^3=27x^6y^9$

C. Subtract Exponents $\frac{3x^2y^5}{15xy^7}=\frac{x}{5y^2}$

Scientific Notation $2.53 \times 10^{5} = 253{,}000$

$3.06 \times 10^{-5} = 0.0000306$

SOL 11: Polynomials

Add/Subtract like terms

Multiply/Distribute, FOIL

$$2x^2 + 3x^2 = 5x^2$$

$$(x+5)(x-8) = x^2 - 8x + 5x - 40 = x^2 - 3x - 40$$

SOL 12: Factoring Binomial/Trinomial Equations

Signs Trinomial= 2 binomials

(+ +)=(+)(+)

(- +)= (-)(-)

(+ -)=(+)(-) Larger factor takes positive sign

(- -)= (+)(-) Larger factor takes negative sign

Different of Squares

$$x^2 - 49 = (x+7)(x-7)$$

SOL 13: Radicals

Use $\sqrt{\ }$ on calculator

or

Reduce $\sqrt{75} = 5\sqrt{3}$

Inverse $(6\sqrt{3})^2 = 108 = 36 \cdot 3$

SOL 14: Solve Quadratic Equation

**Set trinomial =0

$$x^2 - 6x - 18 = 0$$

$$(x-9)(x+3) = 0$$

$$(x-9) = 0$$

$$x = 9$$

$$(x+3) = 0$$

$$x = -3$$

This is also called zeros or solutions

Graphs Parabola Answers is where graph crosses the x-axis

The Zeros , X-intercepts, Function

$$y = x^2 + 7x + 12$$

$$0 = x^2 + 7x + 12$$

$$0 = (x+3)(x+4)$$

$$x = -3, -4$$

SOL 15: Domain, Range, ordered pairs, functions

X Y (x,y) x does not repeat

$\int(x) = x^2 + 5x$ Plug in value for x $\int(5) = 5^2 + 5(5)$

SOL 16: Functional Value

$\int(x)$ =plug in for x

SOL 17: Line of Best Fit

Draw line that goes through most points.
Write Equation use slope, y-intercept y=mx+b

SOL 18: Statistics

Mean- averages (add up all the data and then divide by # of objects)
Mode- Most
Medium- middle # put in order first to last
Rage- high to low

Stem-leaf, Box-whisker read directions, look at graphs

SOL 19: Direct Variation, Graphs

Varies Directly Proportion $\frac{x_1}{x_2} = \frac{y_1}{y_2}$ cross multiply

Varies Inversely Proportion $\frac{x_1}{x_2} = \frac{y_2}{y_1}$ inverse y's and cross multiply

Graph: Goes through origin (0,0) positive slope
Direct variation y=mx+0