

19 Things You Need to Know To Pass the Algebra 1 EOC

1) **Independent Variable** the letter that you can control; your **Input**

Examples: the “x” in $y = m x + b$; the “r” in $A = \pi r^2$

2) **Dependent Variable** the letter that is by itself; your **Output**

Examples: the “y” in $y = m x + b$; the “A” in $A = \pi r^2$; The distance you travel **depends** on the rate and time of which you travel, the “D” in $D = r t$

3) **Slope** rate of change; rise over run; change in “y” divided by the change in “x”;

See your formula chart: $m = \frac{(y_2 - y_1)}{(x_2 - x_1)}$; the “m” in $y = m x + b$; how far a graph

goes up and over from one point to another

4) **x-intercept(s)** point(s) where a graph crosses the x-axis; also known as zero(s) or root(s); ordered pair(s) where the y coordinate is zero;

example if $4x + 3y = 12$, then the x-intercept would be (3, 0)

5) **y-intercept(s)** point(s) where a graph crosses the y-axis; ordered pair(s) where the x coordinate is zero; example if $4x + 3y = 12$, then the y-intercept would be (0, 4); the “b” in $y = m x + b$; example if $y = 2x - 5$, then the y-intercept is (0,-5)

6) **Domain** the set of independent variables; the “x’s”; read a graph from left to right

7) **Range** the set of dependent variables; the “y’s”; read a graph from bottom to top

- 8) **Function** a graph that passes a vertical line test; a set of ordered pairs in which the “x’s” don’t repeat
- 9) **Linear Function** a function (equation) that makes a non-vertical straight line and has a constant rate of change (slope), examples: $f(x) = -2x + 3$, or $5x - 2y = 8$; **Parent Function: $y = x$**
- 10) **Quadratic Function** a function or equation involving x^2 that makes a parabola (a “U” shape), which does not have a constant rate of change (slope), examples: $f(x) = 2x^2 + 4x - 5$ or $y = ax^2 + c$; **Parent Function: $y = x^2$**
- 11) **Exponential Function** a function that has a common multiple or divisor between terms, $f(x) = a(b)^x$; doubling or halving
- 12) **Inverse Variation** $x \cdot y = a$ constant value; $y = a/x$
- 13) **Inequalities** when solving if you multiply or divide by a negative **change** (flip) the inequality; when graphing follow these 4 rules:
- i) if $y >$ the graph is be dotted and shaded above,
 - ii) if $y \geq$ the graph is be solid and shaded above,
 - iii) if $y <$ the graph is be dotted and shaded below,
 - iv) if $y \leq$ the graph is be solid and shaded below,
- 14) **Distributive Property** the **number and the sign** in front of a parenthesis must be multiplied by **everything inside** the parenthesis example: $4(x + 2) - 3(x - 5)$

equals $4(x) + 4(2) + -3(x) + -3(-5) = 4x + 8 - 3x + 15 = x + 23$

- 15) **Value of a function** means substitute or plug a number in for “x” and do the indicated operations to find the value (answer); find the value of $f(x) = 2x^2 - 5x$ if $x = -3$ or $f(-3)$; $2(-3)^2 - 5(-3) = 2(9) + 15 = 18 + 15 = 33$
- 16) **Transformations involving $y = a x^2 + c$** the **bigger** the “a” is the faster the ends of the graph go up if “a” is positive or *down if “a” is negative*, the graph becomes **more narrow**; the **smaller** the “a” is the slower the ends of the graph go up if “a” is positive or *down if “a” is negative*, the graph becomes **wider**; the “c” makes the whole graph go up or down but does not change the size
- 17) **Exponent rules** i) when you multiply common variables add their exponents, example: $(2x^2)(5x^3) = 10 x^{(2+3)} = 10 x^5$
ii) when you divide common variables subtract their exponents, example: $(8x^6) / (4x^3) = 2 x^{(6-3)} = 2 x^3$
iii) any variable or number raised to the zero (0) is one, example: $(2x^2)^0 = 1$
iv) when you have a power raised to a power multiply the exponents, example: $(2x^3)^2 = 4x^{(3 \times 2)} = 4x^6$
- 18) **Parallel** lines that have the **same slope** but different y-intercepts; lines that never intersect
- 19) **Perpendicular** lines that have **opposite reciprocal slopes**; example if one line’s slope is $-1/2$ then the other line’s slope would be 2; lines that intersect at a 90 degree angle