# College Algebra Formulas Tests – Use This to Study

|  |  |  |
| --- | --- | --- |
| Positive | Zero  | Negative |
| $$\left|3x+5\right|=4$$becomes$3x+5=4$ or $3x+5=-4$(drop) (drop/sign flip) | $$\left|3x+5\right|=0$$becomes$$3x+5=0$$ | $$\left|3x+5\right|=-4$$has$$$$ |

For inequalities involving absolute value:

…**positive**, rewrite as a compound or combined inequality without absolute value bars (see examples below)

|  |  |  |
| --- | --- | --- |
| >or$$\geq $$ | $$\left|3x+5\right|>4$$becomes$3x+5>4$ or $3x+5<-4$(drop) (drop/double sign flip) | $$\left|3x+5\right|\geq 7$$becomes$3x+5\geq 7$ or $3x+5\leq -7$(drop) (drop/double sign flip) |
| <or$$\leq $$ | $$\left|3x+5\right|<9$$becomes the combined inequality$$-9<3x+5<9$$ | $$\left|3x+5\right|\leq 2$$becomes the combined inequality$$-2\leq 3x+5\leq 2$$ |

…**zero**, rewrite as an equality or inequality, or state the solution as “All Real Numbers” or “No Solution” (see examples below)

|  |  |  |
| --- | --- | --- |
| >or$$\geq $$ | $$\left|3x+5\right|>0$$becomes the inequality$$3x+5\ne 0$$ | $$\left|3x+5\right|\geq 0$$has the solution$$$$ |
| <or$$\leq $$ | $$\left|3x+5\right|<0$$has$$$$ | $$\left|3x+5\right|\leq 0$$becomes the equality$$3x+5=0$$ |

…**negative**, state the solution as “All Real Numbers” or “No Solution” (see examples below)

|  |  |  |
| --- | --- | --- |
| >or$$\geq $$ | $$\left|3x+5\right|>-4$$has the solution$$$$ | $$\left|3x+5\right|\geq -7$$has the solution$$$$ |
| <or$$\leq $$ | $$\left|3x+5\right|<-9$$has$$$$ | $$\left|3x+5\right|\leq -2$$has$$$$ |

Some equation forms of a line:

Slope-Intercept Form Point-Slope Form Standard/General Form

$y=mx+b$ $y-y\_{1}=m(x-x\_{1})$ $Ax+By=C$

Some equation forms of a circle:

Standard Form General Form

$(x-h)^{2}+(y-k)^{2}=r^{2}$ $x^{2}+y^{2}+ax+by+c=0$

The average rate of change of a function from $a$ to $b$ is $\frac{f\left(b\right)-f(a)}{b-a}$

Given a line passing through points $(x\_{1}, y\_{1})$ and $(x\_{2}, y\_{2})$, the slope $m$ of the line is $m=\frac{rise}{run}=\frac{y\_{2}-y\_{1}}{x\_{2}-x\_{1}}$ as long as $x\_{2}\ne x\_{1}$

Some equation forms of a parabola:

Vertex Form Standard Form

$y=a\left(x-h\right)^{2}+k$ $y=ax^{2}+bx+c$, with vertex $\left(-\frac{b}{2a}, c-\frac{b^{2}}{4a}\right)$

The Law of Exponents:

Given $a>0$ with $a\ne 1$: If $a^{u}=a^{v}$, then $u=v$.

The compound interest formula states that $F=P\left(1+\frac{r}{n}\right)^{nt}$

The continuously compounded interest formula states that $F=Pe^{rt}$

The exponential law states that an amount $A$ varies with time $t$ according to the function $A\left(t\right)=A\_{0}e^{kt}$ As long as the start time is 0, the value of $k$ can be determined using the adder $a$ and either the multiplier $m$ or the divider $d$:

$$ or $$