## College Algebra Formulas Quiz 1 - Answers

Some equation forms of a line:
Slope-Intercept Form
$y=m x+b$
Point-Slope Form
Standard/General Form
$y-y_{1}=m\left(x-x_{1}\right)$
$A x+B y=C$

Some equation forms of a circle:

Standard Form
$(x-h)^{2}+(y-k)^{2}=r^{2}$

General Form
$x^{2}+y^{2}+a x+b y+c=0$

Given a line passing through points $\left(x_{1}, y_{1}\right)$ and $\left(x_{2}, y_{2}\right)$, the slope $m$ of the line is $m=\frac{r i s e}{r u n}=\frac{y_{2}-y_{1}}{x_{2}-x_{1}}$ as long as $x_{2} \neq x_{1}$

The average rate of change of a function from $a$ to $b$ is $\frac{f(b)-f(a)}{b-a}$
Some equation forms of a parabola:
Vertex Form
Standard Form
$y=a(x-h)^{2}+k$

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

Graphing Techniques: Transformations -- Characteristics Worksheet

|  | Horizontal Shift |  | Vertical Shift |  |
| :---: | :---: | :---: | :---: | :---: |
|  | How does the graph change? | It shifts left or right | How does the graph change? | It shifts up or down |
|  | How does the eq'n change? | Replace all $x$ with $\qquad$ $h$ tells the direction of shift | How does the eq'n change? | Add $K$ to the equation |
|  | Which coord's change? How? | Add $\underline{h}$ to all the $\underline{x}$-coordinates | Which coord's change? How? | Add $K$ to all the $y$-coordinates |
| HORIZONTAL TRANSFORMATIONS | Horizontal | Compression | Vertical Compression |  |
|  | How does the graph change? | It compresses towards the $y$ axis | How does the graph change? | It compresses towards the $\underline{X}$ axis |
|  | How does the eq'n change? | Replace all $x$ with $(a x)$ where $a>1$ | How does the eq'n change? | Multiply the equation by $a$ with $0<a<1$ |
|  | Which coord's change? How? | Multiply all of the $\chi$-coordinates by reciprocal of a | Which coord's change? How? | Multiply all of the $y$-coordinates by $a$ |
|  | Horizontal Stretch |  | Vertical Stretch |  |
|  | How does the graph change? | It stretches away from the $y$-axis | How does the graph change? | It stretches away from the $\chi$-axis |
|  | How does the eq'n change? | Replace all $x$ with $(a x)$ where $0<a<1$ | How does the eq'n change? | Multiply the equation by $a$ with $a>1$ |
|  | Which coord's change? How? | Multiply all of the $\chi$-coordinates by recipreal of a | Which coord's change? How? | Multiply all of the $y$-coordinates by $a$ |
|  | Horizontal ( $y$-axis) Reflection |  | Vertical ( $x$-axis) Reflection |  |
|  | How does the graph change? | Spin it around the $y$-axis | How does the graph change? | Spin it around the $\chi$-axis |
|  | How does the eq'n change? | Replace all $x$ with $(-x)$ | How does the eq'n change? | Multiply the equation by -1 |
|  | Which coord's change? How? | Multiply all of the $\chi$-coordinates by -1 | Which coord's change? How? | Multiply all of the $y$-coordinates by -1 |

