Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Per: \_\_\_\_

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| --- | --- | --- | --- | --- |
| Example | Term | What is it? | How does it work/Where do you find it? | What other ideas are related to it? |
| *x* can be any number in the interval$$(-\infty ,\infty )$$or: $-\infty \leq x\leq \infty $ | Domain |  |  |  |
| The graph is decreasing when *x* is in the interval$$(-2, \infty )$$ | Interval of Decrease |  |  |  |
| The graph is increasing when *x* is in the interval$$(-\infty , -2)$$ | Interval of Increase |  |  |  |
| *y* can be any number in the interval$$(-\infty ,1]$$or: $ y\leq 1$ | Range |  |  |  |
| The vertex is the point $(-2, 1)$. The maximum is at $y=1.$ | Vertex/Maximum/Minimum |  |  |  |
| The axis of symmetry between (-3, 0) and (-1, 0):$$x=\frac{-3\pm 1}{2}=\frac{-4}{2}=-2$$The axis of symm. is $x=-2.$ | Axis of Symmetry |  |  |  |
| $-x^{2}-4x$The y-int is (0, -3) | Y-intercept |  |  |  |
| Zeros are: $\left(-3, 0\right)\&(-1, 0)$Plug in to check$$y=-x^{2}-4x-3$$ | Quadratic Solutions/Roots/X-intercepts |  |  |  |
| $y=-3$ is notone-to one, because the inverse $(x=-3)$ does not have exactly one *y*-value for every *x*-value. | One-to-one Function |  |  |  |
| $$\left\{\begin{array}{c}y=3x-4\\y=x^{2}+10x+8\end{array}\right.$$$$3x-4=x^{2}+10x+8$$…solve for *x, plug in for y*:$(-3, 13)$ & $(-4, -16)$ | System of Equations |  |  |  |
| $$\sqrt{104}$$is between$\sqrt{100}$ and$\sqrt{121}$So, $\sqrt{104}$ is between 10 & 11, but closer to 10. | Approximating Square Roots |  |  |  |
| $$\sqrt{104}$$$$\sqrt{104}=\sqrt{4}\sqrt{26}=2\sqrt{26}$$ | Simplifying a Square Root |  |  |  |
|

|  |  |  |
| --- | --- | --- |
|  | $$3x$$ | $$-2$$ |
| $$12x$$ | $$36x^{2}$$ | $$-24x$$ |
| $$+7$$ | $$+21x$$ | $$-14$$ |

The product of $3x-2$ and $12x+7$ is $$. | Determining the Product |  |  |  |
| $$x^{2}+18x+4=0$$$$x^{2}+18x=-4$$$$x^{2}+18x=-4$$$$x^{2}+18x=-4$$Now, factor and solve… | Completing the Square |  |  |  |
| $$x^{2}+18x+4=0$$$$x=\frac{-b\pm \sqrt{b^{2}-4ac}}{2a}$$$$x=\frac{-18\pm \sqrt{(18)^{2}-4(18)(1)}}{2(1)}$$ | The Quadratic Formula |  |  |  |
| $$f\left(x\right)=x^{2}+10x+16$$$$f\left(x\right)=x^{2}+8x+2x+16$$$$f\left(x\right)=x\left(x+8\right)+2(x+8)$$$$f\left(x\right)=(x+2)(x+8)$$ | Factoring |  |  |  |
| $$f\left(x\right)=\left(x+2\right)\left(x+8\right)$$$\left(x+2\right)=0$ or $\left(x+8\right)=0$$x=-2$ or $x=-8$The zeros are $\left(-2, 0\right) \& (-8, 0)$ | Determining Quadratic Zeros from Factored Form |  |  |  |
| The zeros are $\left(-3, 0\right) \& (-1, 0)$ | Determining Quadratic Zeros from a Graph |  |  |  |
| $0\geq -x^{2}-4x-3$The zeros are $\left(-3, 0\right) \& (-1, 0)$ and $0\geq $ arrow is away from y (0), so shading is above. $$\left(-\infty ,-3\right] or [-1,\infty ) $$ | Determining Interval Solutions to a Quadratic Inequality |  |  |  |
| $$f\left(x\right)=\left(x+8\right)^{2}+12$$The parent function has been translated left 8 and up 12. | Translations in Vertex Form |  |  |  |
| The inverse of $(15, -17)$ is $(-17, 15)$. | Write Inverse Points |  |  |  |
| $$y=9x-8$$$$x=9y-8$$$$x+8=9y$$$\frac{1x+8}{9}=y$ $\frac{1}{9}x-\frac{8}{9}=y$  | Write Inverse Equations |  |  |  |

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Concepts you will need to understand for the Semester 1 Final Exam

|  |  |
| --- | --- |
| Approximating Square Roots | Product |
| Axis of Symmetry | Quadratic Formula |
| Completing the Square | Quadratic Inequality |
| Direction that a quadratic graph opens | Quadratic Solutions |
| Domain | Range |
| Factor | Roots |
| Factored Form of a Quadratic | Simplifying a Square Root |
| Interval of Decrease | System of Equations |
| Interval of Increase | Transformation |
| Interval Solutions | Translation |
| Inverse | Vertex |
| Maximum | X-intercepts |
| Minimum | Y-intercept |
| One-to-one Function | Zeros |

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Per: \_\_\_\_

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