### Lesson 5 Practice Problems

1. Rewrite each equation so that the expression on one side could be graphed and the $x$-intercepts of the graph would show the solutions to the equation.
	1. $3x^{2}=81$
	2. $\left(x−1\right)\left(x+1\right)−9=5x$
	3. $x^{2}−9x+10=32$
	4. $6x\left(x−8\right)=29$
	5. Here are equations that define quadratic functions $f,g$, and $h$. Sketch a graph, by hand or using technology, that represents each equation.
	* $f\left(x\right)=x^{2}+4$
	* 
	* $g\left(x\right)=x\left(x+3\right)$
	* 
	* $h\left(x\right)=\left(x−1\right)^{2}$
	* 
	1. Determine how many solutions each $f\left(x\right)=0,g\left(x\right)=0$, and $h\left(x\right)=0$ has. Explain how you know.
2. Mai is solving the equation $\left(x−5\right)^{2}=0$. She writes that the solutions are $x=5$ and $x=-5$. Han looks at her work and disagrees. He says that only $x=5$ is a solution. Who do you agree with? Explain your reasoning.
3. The graph shows the number of square meters, $A$, covered by algae in a lake $w$ weeks after it was first measured.
* In a second lake, the number of square meters, $B$, covered by algae is defined by the equation $B=975⋅\left(\frac{2}{5}\right)^{w}$, where $w$ is the number of weeks since it was first measured.
* 
* For which algae population is the area decreasing more rapidly? Explain how you know.
* (From Unit 5, Lesson 6.)
1. If the equation $\left(x−4\right)\left(x+6\right)=0$ is true, which is also true according to the zero product property?
	1. only $x−4=0$
	2. only $x+6=0$
	3. $x−4=0$ or $x+6=0$
	4. $x=-4$ or $x=6$
* (From Unit 7, Lesson 4.)
	1. Solve the equation $25=4z^{2}$.
	2. Show that your solution or solutions are correct.
* (From Unit 7, Lesson 3.)
1. To solve the quadratic equation $3\left(x−4\right)^{2}=27$, Andre and Clare wrote the following:
* Andre
* $\begin{matrix}3\left(x−4\right)^{2}&=27\\\left(x−4\right)^{2}&=9\\x^{2}−4^{2}&=9\\x^{2}−16&=9\\x^{2}&=25\\x=5 & or  x=-5\end{matrix}$
* Clare
* $\begin{matrix}3\left(x−4\right)^{2}&=27\\\left(x−4\right)^{2}&=9\\x−4&=3\\x&=7\end{matrix}$
	1. Identify the mistake each student made.
	2. Solve the equation and show your reasoning.
* (From Unit 7, Lesson 3.)
1. Decide if each equation has 0, 1, or 2 solutions and explain how you know.
	1. $x^{2}−144=0$
	2. $x^{2}+144=0$
	3. $x\left(x−5\right)=0$
	4. $\left(x−8\right)^{2}=0$
	5. $\left(x+3\right)\left(x+7\right)=0$



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