### Lesson 9 Practice Problems

1. Find **all** the solutions to each equation.
	1. $x\left(x−1\right)=0$
	2. $\left(5−x\right)\left(5+x\right)=0$
	3. $\left(2x+1\right)\left(x+8\right)=0$
	4. $\left(3x−3\right)\left(3x−3\right)=0$
	5. $\left(7−x\right)\left(x+4\right)=0$
2. Rewrite each equation in factored form and solve using the zero product property.
	1. $d^{2}−7d+6=0$
	2. $x^{2}+18x+81=0$
	3. $u^{2}+7u−60=0$
	4. $x^{2}+0.2x+0.01=0$
3. Here is how Elena solves the quadratic equation $x^{2}−3x−18=0$.
* $\begin{matrix}x^{2}−3x−18&=0\\\left(x−3\right)\left(x+6\right)&=0\\x−3=0  or & x+6=0\\x=3  or & x=-6\end{matrix}$
* Is her work correct? If you think there is an error, explain the error and correct it.
* Otherwise, check her solutions by substituting them into the original equation and showing that the equation remains true.
1. Jada is working on solving a quadratic equation, as shown here.
* $\begin{matrix}p^{2}−5p&=0\\p\left(p−5\right)&=0\\p−5&=0\\p&=5\end{matrix}$
* She thinks that her solution is correct because substituting 5 for $p$ in the original expression $p^{2}−5p$ gives $5^{2}−5\left(5\right)$, which is $25−25$ or 0.
* Explain the mistake that Jada made and show the correct solutions.
1. Choose a statement to correctly describe the zero product property.
* If $a$ and $b$ are numbers, and $a⋅b=0$, then:
	1. Both $a$ and $b$ must equal 0.
	2. Neither $a$ nor $b$ can equal 0.
	3. Either $a=0$ or $b=0$.
	4. $a+b$ must equal 0.
* (From Unit 7, Lesson 4.)
1. Which expression is equivalent to $x^{2}−7x+12$?
	1. $\left(x+3\right)\left(x+4\right)$
	2. $\left(x−3\right)\left(x−4\right)$
	3. $\left(x+2\right)\left(x+6\right)$
	4. $\left(x−2\right)\left(x−6\right)$
* (From Unit 7, Lesson 6.)
1. These quadratic expressions are given in standard form. Rewrite each expression in factored form. If you get stuck, try drawing a diagram.
	1. $x^{2}+7x+6$
	2. $x^{2}−7x+6$
	3. $x^{2}−5x+6$
	4. $x^{2}+5x+6$
* (From Unit 7, Lesson 6.)
1. Select **all** the functions whose output values will eventually overtake the output values of function $f$ defined by $f\left(x\right)=25x^{2}$.
	1. $g\left(x\right)=5\left(2\right)^{x}$
	2. $h\left(x\right)=5^{x}$
	3. $j\left(x\right)=x^{2}+5$
	4. $k\left(x\right)=\left(\frac{5}{2}\right)^{x}$
	5. $m\left(x\right)=5+2^{x}$
	6. $n\left(x\right)=2x^{2}+5$
* (From Unit 6, Lesson 4.)
1. A piecewise function, $p$, is defined by this rule: $p\left(x\right)=\left\{\begin{matrix}x−1,&x\leq -2\\2x−1,&x>-2\end{matrix}\right.$
* Find the value of $p$ at each given input.
	1. $p\left(-20\right)$
	2. $p\left(-2\right)$
	3. $p\left(4\right)$
	4. $p\left(5.7\right)$
* (From Unit 4, Lesson 12.)



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