### Lesson 20 Practice Problems

1. Decide whether each number is rational or irrational.

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| * 10
 | * $\frac{4}{5}$
 | * $\sqrt{4}$
 | * $\sqrt{10}$
 | * -3
 | * $\sqrt{\frac{25}{4}}$
 | * $\sqrt{0.6}$
 |

*
1. Here are the solutions to some quadratic equations. Select **all** solutions that are rational.
	1. $5\pm 2$
	2. $\sqrt{4}\pm 1$
	3. $\frac{1}{2}\pm 3$
	4. $10\pm \sqrt{3}$
	5. $\pm \sqrt{25}$
	6. $1\pm \sqrt{2}$
2. Solve each equation. Then, determine if the solutions are rational or irrational.
	1. $\left(x+1\right)^{2}=4$
	2. $\left(x−5\right)^{2}=36$
	3. $\left(x+3\right)^{2}=11$
	4. $\left(x−4\right)^{2}=6$
3. Here is a graph of the equation $y=81\left(x−3\right)^{2}−4$.
	1. Based on the graph, what are the solutions to the equation $81\left(x−3\right)^{2}=4$?
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	1. Can you tell whether they are rational or irrational? Explain how you know.
	2. Solve the equation using a different method and say whether the solutions are rational or irrational. Explain or show your reasoning.
4. Match each equation to an equivalent equation with a perfect square on one side.
	1. $x^{2}−9x=\frac{1}{2}$
	2. $x^{2}+6.4x−8.9=0$
	3. $x^{2}−5x=11$
	4. $x^{2}+0.1x+0.0005=0$
	5. $x^{2}−\frac{6}{7}x=\frac{1}{49}$
	6. $x^{2}+1.21x=6.28$
	7. $\left(x−2.5\right)^{2}=17.25$
	8. $\left(x−\frac{9}{2}\right)^{2}=\frac{83}{4}$
	9. $\left(x−\frac{3}{7}\right)^{2}=\frac{10}{49}$
	10. $\left(x+0.05\right)^{2}=0.002$
	11. $\left(x+3.2\right)^{2}=19.14$
	12. $\left(x+0.605\right)^{2}=6.646025$
* (From Unit 7, Lesson 13.)
1. To derive the quadratic formula, we can multiply $ax^{2}+bx+c=0$ by an expression so that the coefficient of $x^{2}$ is a perfect square and the coefficient of $x$ is an even number.
	1. Which expression, $a$, $2a$, or $4a$, would you multiply $ax^{2}+bx+c=0$ by to get started deriving the quadratic formula?
	2. What does the equation $ax^{2}+bx+c=0$ look like when you multiply both sides by your answer?
* (From Unit 7, Lesson 19.)
1. Here is a graph that represents $y=x^{2}$.
* On the same coordinate plane, sketch and label the graph that represents each equation:
	1. $y=-x^{2}−4$
	2. $y=2x^{2}+4$
* 
* (From Unit 6, Lesson 12.)
1. Which quadratic expression is in vertex form?
	1. $x^{2}−6x+8$
	2. $\left(x−6\right)^{2}+3$
	3. $\left(x−3\right)\left(x−6\right)$
	4. $\left(8−x\right)x$
* (From Unit 6, Lesson 15.)
1. Function $f$ is defined by the expression $\frac{5}{x−2}$.
	1. Evaluate $f\left(12\right)$.
	2. Explain why $f\left(2\right)$ is undefined.
	3. Give a possible domain for $f$.
* (From Unit 4, Lesson 10.)



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