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.

a. $3x^2 = 81$

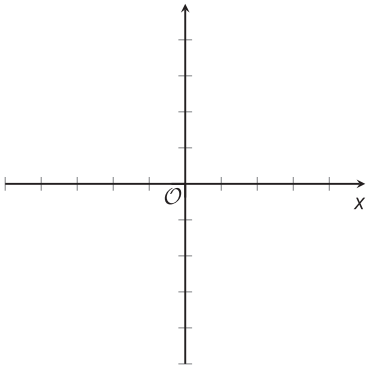
b. $(x - 1)(x + 1) - 9 = 5x$

c. $x^2 - 9x + 10 = 32$

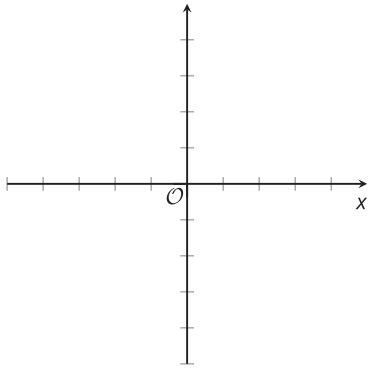
d. $6x(x - 8) = 29$

2 a. Here are equations that define quadratic functions f, g, and h. Sketch a graph, by hand or using technology, that represents each equation.

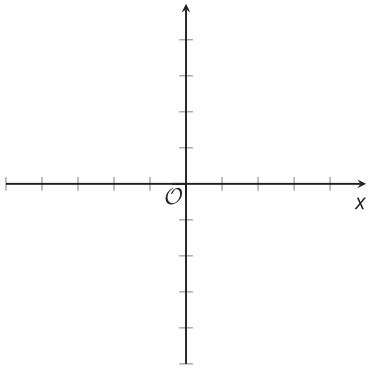
$f(x) = x^2 + 4$



$g(x) = x(x + 3)$



$h(x) = (x - 1)^2$



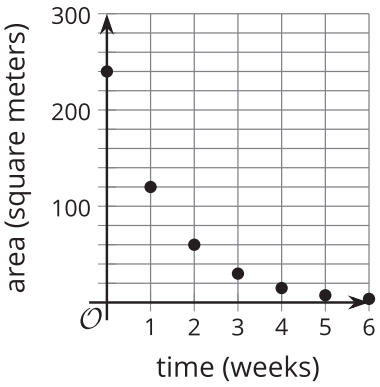
b. Determine how many solutions each of $f(x) = 0$, $g(x) = 0$, and $h(x) = 0$ has. Explain how you know.

3 Mai is solving the equation $(x - 5)^2 = 0$. 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.

4 from Unit 6, Lesson 6

The graph shows a model of the number of square meters, A, of a lake that is covered by algae w weeks after it was first measured.

In a second lake, the number of square meters, B, covered by algae is modeled by the equation $B = 975 \cdot \left(\frac{2}{5}\right)^w$, where w is the number of weeks since it was first measured.



For which algae population model is the area decreasing more rapidly? Explain how you know.

5 from Unit 8, Lesson 4

If the equation $(x - 4)(x + 6) = 0$ is true, which is also true according to the zero product property?

A. Only $x - 4 = 0$.

B. Only $x + 6 = 0$.

C. $x - 4 = 0$ or $x + 6 = 0$.

D. $x = -4$ or $x = 6$.

6 from Unit 8, Lesson 3

a. Solve the equation $25 = 4z^2$.

b. Show that your solution or solutions are correct.

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from Unit 8, Lesson 3

To solve the quadratic equation $3(x-4)^2 = 27$, Andre and Clare wrote the following:

Andre

$$\begin{aligned} 3(x-4)^2 &= 27 \\ (x-4)^2 &= 9 \\ x^2 - 4^2 &= 9 \\ x^2 - 16 &= 9 \\ x^2 &= 25 \\ x = 5 \quad &\text{or} \quad x = -5 \end{aligned}$$

Clare

$$\begin{aligned} 3(x-4)^2 &= 27 \\ (x-4)^2 &= 9 \\ x-4 &= 3 \\ x &= 7 \end{aligned}$$

a. Identify the mistake each student made.

b. Solve the equation, and show your reasoning.

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Decide if each equation has 0, 1, or 2 solutions, and explain how you know.

a. $x^2 - 144 = 0$

b. $x^2 + 144 = 0$

c. $x(x-5) = 0$

d. $(x-8)^2 = 0$

e. $(x+3)(x+7) = 0$