Lesson 4 Practice Problems

1. If the equation $(x + 10)x = 0$ is true, which statement is also true according to the zero product property?

   A. only $x = 0$

   B. either $x = 0$ or $x + 10 = 0$

   C. either $x^2 = 0$ or $10x = 0$

   D. only $x + 10 = 0$

2. What are the solutions to the equation $(10 - x)(3x - 9) = 0$?

   A. -10 and 3

   B. -10 and 9

   C. 10 and 3

   D. 10 and 9

3. Solve each equation.

   a. $(x - 6)(x + 5) = 0$

   b. $(x - 3)(\frac{2}{3}x - 6) = 0$

   c. $(-3x - 15)(x + 7) = 0$

4. Consider the expressions $(x - 4)(3x - 6)$ and $3x^2 - 18x + 24$.

   Show that the two expressions define the same function.

5. Kiran saw that if the equation $(x + 2)(x - 4) = 0$ is true, then, by the zero product property, either $x + 2$ is 0 or $x - 4$ is 0. He then reasoned that, if $(x + 2)(x - 4) = 72$ is true, then either $x + 2$ is equal to 72 or $x - 4$ is equal to 72.

   Explain why Kiran's conclusion is incorrect.

6. Andre wants to solve the equation $5x^2 - 4x - 18 = 20$. He uses a graphing calculator to graph $y = 5x^2 - 4x - 18$ and $y = 20$ and finds that the graphs cross at the points $(-2.39, 20)$ and $(3.19, 20)$.

   a. Substitute each x-value Andre found into the expression $5x^2 - 4x - 18$. Then evaluate the expression.

   b. Why did neither solution make $5x^2 - 4x - 18$ equal exactly 20?

(From Unit 7, Lesson 2.)

7. Select **all** the solutions to the equation $7x^2 = 343$.

   A. 49

   B. $-\sqrt{7}$

   C. 7

   D. -7

   E. $\sqrt{49}$

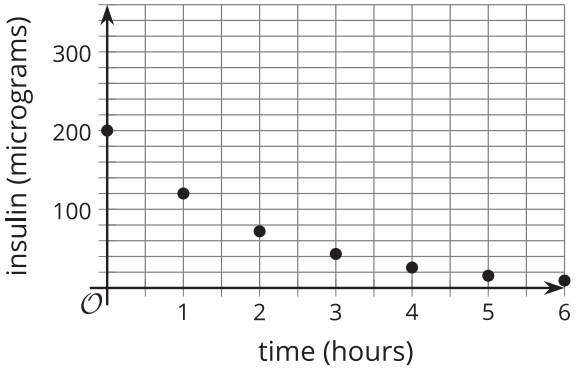
   F. $\sqrt{-49}$

   G. $-\sqrt{49}$

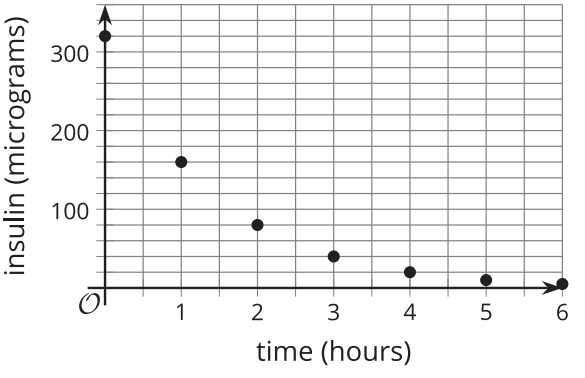
(From Unit 7, Lesson 3.)

8. Here are two graphs that correspond to two patients, A and B. Each graph shows the amount of insulin, in micrograms (mcg) in a patient's body h hours after receiving an injection. The amount of insulin in each patient decreases exponentially.

Patient A



Patient B



Select **all** statements that are true about the insulin level of the two patients.

A. After the injection, the patients have the same amount of insulin in their bodies.

B. An equation for the micrograms of insulin, a, in Patient A's body h hours after the injection is $a = 200 \cdot \left(\frac{3}{5}\right)^h$.

C. The insulin in Patient A is decaying at a faster rate than in Patient B.

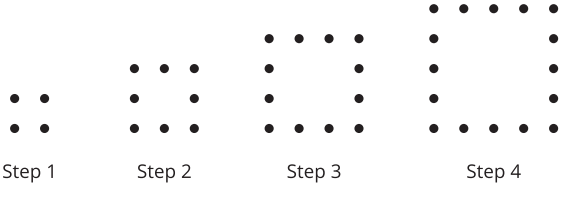
D. After 3 hours, Patient A has more insulin in their body than Patient B.

E. At some time between 2 and 3 hours, the patients have the same insulin level.

(From Unit 5, Lesson 6.)

9. Han says this pattern of dots can be represented by a quadratic relationship because the dots are arranged in a rectangle in each step.

Do you agree? Explain your reasoning.



(From Unit 6, Lesson 2.)