

Lesson 8 Practice Problems

1. Match each quadratic expression given in factored form with an equivalent expression in standard form. One expression in standard form has no match.

A. $(y + x)(y - x)$

B. $(11 + x)(11 - x)$

C. $(x - 11)(x + 11)$

D. $(x - y)(x - y)$

1. $121 - x^2$

2. $x^2 + 2xy - y^2$

3. $y^2 - x^2$

4. $x^2 - 2xy + y^2$

5. $x^2 - 121$

2. Both $(x - 3)(x + 3)$ and $(3 - x)(3 + x)$ contain a sum and a difference and have only 3 and x in each factor.

If each expression is rewritten in standard form, will the two expressions be the same? Explain or show your reasoning.

3. a. Show that the expressions $(5 + 1)(5 - 1)$ and $5^2 - 1^2$ are equivalent.

b. The expressions $(30 - 2)(30 + 2)$ and $30^2 - 2^2$ are equivalent and can help us find the product of two numbers. Which two numbers are they?

c. Write $94 \cdot 106$ as a product of a sum and a difference, and then as a difference of two squares. What is the value of $94 \cdot 106$?

4. Write each expression in factored form. If not possible, write “not possible.”

a. $x^2 - 144$

b. $x^2 + 16$

c. $25 - x^2$

d. $b^2 - a^2$

e. $100 + y^2$

5. What are the solutions to the equation $(x - a)(x + b) = 0$?

A. a and b

B. $-a$ and $-b$

C. a and $-b$

D. $-a$ and b

(From Unit 7, Lesson 4.)

6. Create a diagram to show that $(x - 3)(x - 7)$ is equivalent to $x^2 - 10x + 21$.

(From Unit 7, Lesson 6.)

7. Select **all** the expressions that are equivalent to $8 - x$.

A. $x - 8$

B. $8 + (-x)$

C. $-x - (-8)$

D. $-8 + x$

E. $x - (-8)$

F. $x + (-8)$

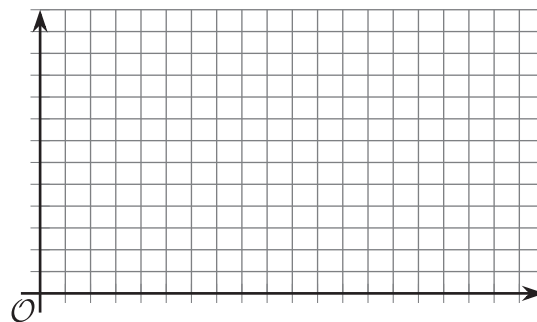
G. $-x + 8$

(From Unit 7, Lesson 6.)

8. Mai fills a tall cup with hot cocoa, 12 centimeters in height. She waits 5 minutes for it to cool. Then, she starts drinking in sips, at an average rate of 2 centimeters of height every 2 minutes, until the cup is empty.

The function C gives the height of hot cocoa in Mai's cup, in centimeters, as a function of time, in minutes.

- Sketch a possible graph of C . Be sure to include a label and a scale for each axis.
- What quantities do the domain and range represent in this situation?



- Describe the domain and range of C .

(From Unit 4, Lesson 11.)

9. Two bacteria populations are measured at the same time. One bacteria population, p , is modeled by the equation $p = 250,000 \cdot \left(\frac{1}{2}\right)^d$, where d is the number of days since it was first measured. The second bacteria population, q , is modeled by the equation $q = 500,000 \cdot \left(\frac{1}{3}\right)^d$.

Which statement is true about the two populations?

- The second population will always be larger than the first.
- Both populations are increasing.
- The second bacteria population decreases more rapidly than the first.
- When initially measured, the first population is larger than the second.

(From Unit 5, Lesson 7.)