# Unit 2 Lesson 6: Different Forms

## 1 Which One Doesn’t Belong: Small Differences (Warm up)

### Student Task Statement

Which one doesn’t belong?

A: $y = (x + 4)(x - 6)$

B: $y = 2x^2 - 8x - 24$

C: $y = x^2 + 5x - 25$

D: $y = x^3 + 3x^2 - 10x - 24$

# 2 The Return of the Box

## Student Task Statement

Earlier, we learned we can make a box from a piece of paper by cutting squares of side length $x$ from each corner and then folding up the sides. Let's say we now have a piece of paper that is 8.5 inches by 14 inches. The volume $V$, in cubic inches, of the box is a function of the side length $x$ where $V(x) = (14 - 2x)(8.5 - 2x)(x)$.

1. Identify the degree and leading term of the polynomial. Explain or show your reasoning.
2. Without graphing, what can you say about the horizontal and vertical intercepts of the graph of $V$? Do these points make sense in this situation?

# 3 Using Diagrams to Multiply (Optional)

## Student Task Statement

1. Use the distributive property to show that each pair of expressions is equivalent.
   a. $(x + 2)(x + 4)$ and $x^2 + 6x + 8$

   b. $(x + 6)(x + \text{-}5)$ and $x^2 + x - 30$

   c. $(x^2 + 10x + 7)(2x - 1)$ and $2x^3 + 19x^2 + 4x - 7$

   d. $(4x^3 - 8)(x^2 + 3)$ and $4x^5 + 12x^3 - 8x^2 - 24$

2. Write a pair of expressions that each have 2 or 3 terms, and trade them with your partner. Multiply the expressions they gave you.

# 4 Spot the Differences

## Student Task Statement

Let $f(x) = (x - 2)(x + 3)(x - 7)$ and $g(x) = \frac{1}{2}(x - 2)(x + 3)(x - 7)$.

1. Use graphing technology to graph both functions in the same window of $-10 \leq x \leq 10$ and $-100 \leq y \leq 100$. Describe how the two graphs are the same and how they are different.
2. What degree do these polynomials have? Rewrite each expression in standard form to check.
3. Let $h(x) = (3x - 6)(x + 3)(x - 7)$. What do you think the graph of $y = h(x)$ will look like compared to $y = f(x)$? Use graphing technology to check your prediction.

**Images for Activity Synthesis**