For problems 1-6, as each expression is written, how many factors of the expression are there? If it’s not really factored, say, ”One.” For $x^3$, count that as three factors.

1. $2x^3(x - 3)$.

2. $x^5(x - 1)(x + 1)$.

3. $x^2 + 2x - 3$.

4. $5x(x + 3)^2$.

5. $(x + 3)^6$.

6. $2x(x - 3)$.

In problems 7-13, factor more if needed, and simplify by canceling common factors. Leave your answers in factored form.

7. $\frac{(x - 2)(x + 1)}{(x + 1)(x + 3)}$.

8. $\frac{x^2 - 1}{x^2 - 2x + 1}$.

9. $\frac{x^2 + 3x - 10}{x^2 + 6x + 5}$.

10. $\frac{x(x^2 - 2x - 3)}{x^2 + 2x}$.

11. $\frac{x^2 + 6x + 9}{x^2 - 9}$.

12. $\frac{x^2 - x - 12}{x^2 - 9}$.

13. $\frac{(x + 1)^2 - 9}{(x + 1)(x - 2)}$. Note: the numerator has only one factor. You must multiply it out completely, and then factor.

Answers on next page.
Answers:

1) five.
2) seven.
3) one.
4) four.
5) six.
6) three.
7) \( \frac{x - 2}{x + 3} \).
8) \( \frac{x + 1}{x - 1} \).
9) \( \frac{x - 2}{x + 1} \).
10) \( \frac{(x - 3)(x + 1)}{x + 2} \).
11) \( \frac{x + 3}{x - 3} \).
12) \( \frac{x - 4}{x - 3} \).
13) \( \frac{x + 4}{x + 1} \).