

## 8-8

## Practice

Form K

## Factoring by Grouping

Find the GCF of the first two terms and the GCF of the last two terms for each polynomial.

1.  $6n^3 + 3n^2 + 10n + 5$   $3n^2; 5$

2.  $12z^3 + 36z^2 + 4z + 12$   $12z^2; 4$

3.  $9k^3 + 45k^2 + 2k + 10$   $9k^2; 2$

4.  $11a^3 + 33a^2 + 8a + 24$   $11a^2; 8$

5.  $2f^3 + 5f^2 - 4f - 10$   $f^2; -2$

6.  $16d^3 - 24d^2 - 6d + 9$   $8d^2; -3$

Factor each expression.

7.  $6x^3 - 4x^2 + 15x - 10$   
 $(2x^2 + 5)(3x - 2)$

8.  $5q^3 - 40q^2 - 4q + 32$   
 $(5q^2 - 4)(q - 8)$

9.  $28m^3 + 7m^2 - 8m - 2$   
 $(7m^2 - 2)(4m + 1)$

10.  $3p^3 + 5p^2 + 9p + 15$   
 $(p^2 + 3)(3p + 5)$

11.  $18y^3 - 6y^2 - 63y + 21$   
 $3(2y^2 - 7)(3y - 1)$

12.  $3t^3 - 18t^2 + 5t - 30$   
 $(3t^2 + 5)(t - 6)$

13.  $250c^3 - 250c^2 + 100c - 100$   
 $50(5c^2 + 2)(c - 1)$

14.  $18g^3 - 33g^2 + 30g - 55$   
 $(3g^2 + 5)(6g - 11)$

15.  $88n^3 + 77n^2 - 72n - 63$   
 $(11n^2 - 9)(8n + 7)$

16.  $50h^3 - 40h^2 + 60h - 48$   
 $2(5h^2 + 6)(5h - 4)$

17.  $24b^3 - 96b^2 - 14b + 56$   
 $2(12b^2 - 7)(b - 4)$

18.  $54r^3 + 9r^2 - 6r - 1$   
 $(9r^2 - 1)(6r + 1)$

## 8-8

## Practice (continued)

Form K

## Factoring by Grouping

Factor completely.

19.  $49s^3 + 14s^2 + 14s + 4$   
 $(7s^2 + 2)(7s + 2)$

20.  $32h^4 + 72h^3 + 36h^2 + 81h$   
 $h(8h^2 + 9)(4h + 9)$

21.  $42z^4 - 48z^3 - 7z^2 + 8z$   
 $z(6z^2 - 1)(7z - 8)$

22.  $60p^3 + 48p^2 + 25p + 20$   
 $(12p^2 + 5)(5p + 4)$

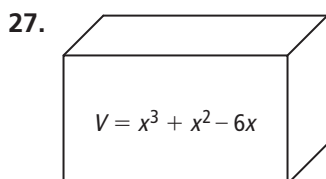
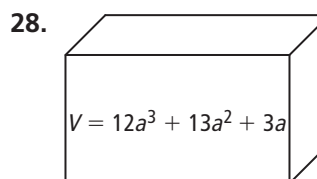
23.  $26n^4 - 14n^3 + 91n^2 - 49n$   
 $n(2n^2 + 7)(13n - 7)$

24.  $40t^3 + 28t^2 - 30t - 21$   
 $(4t^2 - 3)(10t + 7)$

25.  $45k^4 - 9k^3 + 10k^2 - 2k$   
 $k(9k^2 + 2)(5k - 1)$

26.  $18b^5 - 3b^4 + 30b^3 - 5b^2$   
 $b^2(3b^2 + 5)(6b - 1)$

Find linear expressions for the possible dimensions of each rectangular prism.

 $x$  by  $(x + 3)$  by  $(x - 2)$  $a$  by  $(3a + 1)$  by  $(4a + 3)$ 

29. A storage bin in the shape of a rectangular prism has a volume of  $10x^3 + 9x^2 + 2x$ . What linear expressions can represent possible dimensions of the bin?  $x$ ;  $(5x + 2)$ ;  $(2x + 1)$

30. **Writing** Describe the first step to look for in factoring a cubic expression containing four terms.

Check to see if you can factor a GCF from all four terms.

31. **Open-Ended** Write a 4-term expression that you can factor by grouping. Factor your polynomial.

Answers may vary. Sample:  $4x^3 + 36x^2 + 7x + 63 = (4x^2 + 7)(x + 9)$