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Practice

Form K

Multiplying and Factoring

Simplify each product.

1. $3w(w + 2)$

$3w^2 + 6w$

2. $(z + 5)2z$

$2z^2 + 10z$

3. $3m^2(4 + m)$

$12m^2 + 3m^3$

4. $2p(p^2 - 6p + 1)$

$2p^3 - 12p^2 + 2p$

5. $-y(5y^3 - 3y^2 + 2y)$

$-5y^4 + 3y^3 - 2y^2$

6. $3a(-3a^2 + 2a - 7)$

$-9a^3 + 6a^2 - 21a$

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

$18x^5 - 6x^4 + 60x^3$

8. $-4h(-h^3 - 8h^2 + 2h)$

$4h^4 + 32h^3 - 8h^2$

9. $4n(n^2 + 5n + 6)$

$4n^3 + 20n^2 + 24n$

Find the GCF of the terms of each polynomial.

10. $16q + 32$

16

11. $4t^3 - 24t$

$4t$

12. $32y - 24$

8

13. $x^3 + 3x^2 + 5x$

x

14. $5d^3 + 20d - 35$

5

15. $2m^3 + 10m^2 + 12m$

$2m$

16. $7g^4 + 21g^3 - 14g^2$

$7g^2$

17. $15z^3 + 3z^2 - 27z$

$3z$

18. $33w^7 + 55w^5 - 22w^3$

$11w^3$

Factor each polynomial.

19. $9t - 3$

$3(3t - 1)$

20. $12j^3 + 28$

$4(3j^3 + 7)$

21. $72x^2 - 63x$

$9x(8x - 7)$

22. $12k^3 - 9k^2 + 6$

$3(4k^3 - 3k^2 + 2)$

23. $30n^3 + 18n^2 + 54n$

$6n(5n^2 + 3n + 9)$

24. $32z^4 - 80z^3 + 112z^2$

$16z^2(2z^2 - 5z + 7)$

25. $12n^4 + 16n^3 + 20n^2$

$4n^2(3n^2 + 4n + 5)$

26. $24y^6 + 36y^4 + 42y^2$

$6y^2(4y^4 + 6y^2 + 7)$

27. $7q^5 + 21q^3 - 49q$

$7q(q^4 + 3q^2 - 7)$

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Practice (continued)

Form K

Multiplying and Factoring

28. You are painting a rectangular wall with length $5x^2$ ft and width $12x$ ft. There is a rectangular door that measures x ft by $2x$ ft that will not be painted. What is the area of the wall that is to be painted? Write your answer in factored form.

$$2x^2(30x - 1)$$

Simplify. Write in standard form.

29. $-3m(2m^2 - 5m + 10)$
 $-6m^3 + 15m^2 - 30m$

30. $-5t^2(-6t^3 + 12t)$
 $30t^5 - 60t^3$

31. $10x(-4x^2 + x - 3)$
 $-40x^3 + 10x^2 - 30x$

32. $-2v(3v^3 - 6v^2 + 2v)$
 $-6v^4 + 12v^3 - 4v^2$

33. $5y(y + 2) - y(y - 3)$
 $4y^2 + 13y$

34. $-2b^2(-4b^2 + 3b)$
 $8b^4 - 6b^3$

Factor each polynomial.

35. $13cd^3 + 39c^2d^2$
 $13cd^2(d + 3c)$

36. $5x^3y^4 - 25xy^2$
 $5xy^2(x^2y^2 - 5)$

37. $42m^5n + 28m^4$
 $14m^4(3mn + 2)$

38. $36fg^2 + 54f^2g^4$
 $18fg^2(2 + 3fg^2)$

39. $8s^8t^4 + 20s^4t^3$
 $4s^4t^3(2s^4t + 5)$

40. $12a^2b^5 + 156a^2b^3$
 $12a^2b^3(b^2 + 13)$

41. **Open-Ended** Write a quadratic monomial and a cubic trinomial. Then find their product and write it in standard form.

Answers may vary. Sample: x^2 and $2x^3 + x^2 + x$; $2x^5 + x^4 + x^3$

42. A rectangle has a length of $6x^3y^2 - 1$ and a width of $3xy + 2$. The formula for the perimeter of a rectangle is $P = 2l + 2w$, where l is the length and w is the width. What is the perimeter of the rectangle? Simplify your answer. $12x^3y^2 + 6xy + 2$