SM 3H

1.2 Polynomial Identities & Factoring

2023-2024

SCORE: /

Name _____ Date _____ Period _____

Expand the product using polynomial identities, if possible. Show work if it is not an identity!

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

2. $(3x-y)(3x+y)$

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

4. $(u+3v)^3$

5. $\left(\sqrt{u}+\sqrt{v}\right)\left(\sqrt{u}-\sqrt{v}\right)$

6. $(x-2)(x^2+2x+4)$

Factor each expression using the polynomial identities where possible. If you used an identity, write the identity you used. Show work if it is not an identity!

7. x^2-121

8. $y^2+8y+16$

9. y^3+125

10. $x^2+9x+14$

11. $64-25y^2$

12. $27y^3-8$

13. $3x^2-7x-6$

14. $5x^2+13x-6$

15. $64x^3+27$

Factor each polynomial completely. Look for GCF first, then identify whether it is a polynomial identity. Then write which identity it is. Factor accordingly. Show work!

16. $-3k^2 + 24k + 60$

17. $18xy + 24x - 3ky - 4k$

18. $6n^3 - 3n^2$

19. $32a^2 - 18b^2$

20. $-14n^2 - 122n + 36$

21. $x^4 - 4x^2 - 45$

22. $245y^2 + 350yx + 125x^2$

23. $-x^3 - 1$

24. $8 - 125x^3$

25. $1 + 27x^6$

26. $6u^4 - 6u^2 - 540$

27. $3x^2y + 6xy - 4x - 8$

28. $2y^2 - 7yx - 15x^2$

29. $-x^4 + 7x^2 + 18$

30. $-16y^4 + 25x^6$

31. $25x^4 - 49$

Solve each equation by factoring. Show work!

32. $x^2 - x - 90 = 0$

33. $5x^2 + 10x = 0$

Review Problems

Divide using long division. No calculator. Write remainder as a simplified fraction. You must show your work.

34. $3{,}248 \div 5$

35. $58{,}467 \div 12$

Simplify each expression using the correct operation. Show work!

36. $(2x^3 - x + 1) - (4x^3 + 2x^2 - 5x)$

37. $(x - 3)(x^2 - 2x + 4)$

38. $f(x) = x^3 - x^2 - 5x - 3$, find $f(-1)$