

Enrichment 5-9

More Exponent Patterns

1. a. Simplify 4^3 . _____
 b. Simplify 2^6 . _____
 c. What do you notice? _____
2. a. Simplify 9^4 . _____
 b. Simplify 3^8 . _____
 c. What do you notice? _____
3. Substitute 2^2 for 4 in 4^3 and simplify to show why the pattern in Exercise 1 holds.

4. Substitute 3^2 for 9 in 9^4 and simplify to show why the pattern in Exercise 2 holds.

You can use this relationship to simplify expressions like $5^4 \cdot 25^3$:
 $5^4 \cdot 25^3 = 5^4 \cdot (5^2)^3 = 5^4 \cdot 5^6 = 5^{10}$

Simplify each expression.

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|---------------------------------------|---------------------------------------|
| 5. $2^5 \cdot 4^3$ _____ | 6. $3^4 \cdot 9^3$ _____ |
| 7. $8^2 \cdot 2^6$ _____ | 8. $36^2 \cdot 6^3$ _____ |
| 9. $81^2 \cdot 3^5$ _____ | 10. $4^3 \cdot 16^2 \cdot 2^4$ _____ |
| 11. $32^2 \cdot 16^3$ _____ | 12. $125^2 \cdot 5^4$ _____ |
| 13. $16^4 \cdot 2^7 \cdot 4^3$ _____ | 14. $27^4 \cdot 3^6$ _____ |
| 15. $49^5 \cdot 7^3$ _____ | 16. $100^5 \cdot 10^7$ _____ |
| 17. $81^6 \cdot 3^5 \cdot 27^4$ _____ | 18. $4^7 \cdot 32^3 \cdot 16^5$ _____ |