Simplify. Assume that variable exponents represent positive integers.

A

1. $3z^2 \cdot 2z^3$
2. $5r^2 \cdot r^4$
3. $(-t^4)^3$
4. $(-t^3)^4$
5. $(3x^2y)(xy^2)$
6. $(4p^2q)(p^2q^3)$
7. $(-2u^2)(uv^3)(-u^2v^2)$
8. $(r^2s)(-3rs^3)(2rs)$
9. $(4a^3b^2)^2$
10. $(2c^2d^3)^3$
11. $(-3pq^4r^2)^3$
12. $(-x^2yz^3)^4$
13. $(-z^3)(-z)^3$
14. $(-c)^2(-c^4)$
15. $(s^2t)^3(st^3)^2$
16. $(2x^2y^3)^3(3x^3y)^2$
17. $3y(y^3 - 2y^2 + 3)$
18. $x^2(x - 2x^2 + 3x^3)$
19. $rs^2(r^2 - 2rs - s^2)$
20. $p^2q^3(p^2 - 4q)$
21. $z^{n-2} \cdot z^{n+2}$
22. $t^4 \cdot t^{k-4}$
23. $x^{m-1} \cdot x \cdot x^m$
24. $y^{p+2} \cdot y^p \cdot y^{p-2}$
25. $r^{h-2}(r^{h+1})^2$
26. $s^3(s^{2k-1})^3$

B

27. $t(t^{n-1} + t^n + t^{n+1})$
28. $x^2(x^k - x^{k-1} + x^{k-2})$
29. $p^n(p^{m-n+1} + p^{m-n})$
30. $s^{2n}(s^{2m-n} - s^{m-2n})$
31. $z^{m-n}(z^{n+m} - z^{n-m} + z^n)$
32. $x^{h+k}(x^{2h-k} - x^{h-2k} + x^k)$
33. $(t^m)^n(t^n)^{n-m}$
34. $(y^{h-k})^h(y^{h+k})^k$

In Exercises 35–38, solve for n.

35. $3^{5n} = 3^5(3^{2n})^2$
36. $(2^{3n})^2 = (2^n)^3 \cdot 2^{n+6}$
37. $3 \cdot 9^{2n} = (3^{n+1})^3$
38. $4^{n+3} \cdot 16^n = 8^{3n}$