

Practice 6-8

The Binomial Theorem

Use the Binomial Theorem to expand each binomial.

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|-----------------|----------------|----------------------|-------------------|
| 1. $(x + 2)^4$ | 2. $(a + 2)^7$ | 3. $(x + y)^7$ | 4. $(d - 2)^9$ |
| 5. $(2x - 3)^8$ | 6. $(x - 1)^9$ | 7. $(2x^2 - 2y^2)^6$ | 8. $(x^5 + 2y)^7$ |
9. What is the probability that you will roll exactly five sixes in ten tosses of a number cube?
 10. One airline recently had a rate of 52 complaints per 100,000 departures, or a 0.00052 probability of a complaint on each flight.
 - a. What is the probability that the airline will not have a complaint in 20 flights?
 - b. What is the probability that the airline will not have a complaint in 100 flights?
 - c. What is the probability that the airline will have a complaint in 100 flights?
 11. 6% of the circuit boards assembled at a certain production plant are defective. If five circuit boards are chosen at random, what is the probability that exactly two are defective?
 12. The probability that a baby will be a boy is $\frac{1}{2}$. What is the probability that a family with five children has all boys?
 13. Your friend's batting average is 0.225. What is the probability of her getting three or more hits in the next five times at bat?
 14. If a classmate randomly guesses on ten multiple choice questions, what is the probability that six or more answers will be right? The probability of each answer being correct is 0.2.

Use Pascal's Triangle to expand each binomial.

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|---------------------|---------------------|-------------------|----------------------|
| 15. $(n - 3)^3$ | 16. $(2n + 2)^4$ | 17. $(n - 6)^5$ | 18. $(n - 1)^6$ |
| 19. $(2a + 2)^3$ | 20. $(x^2 - y^2)^4$ | 21. $(2x + 3y)^5$ | 22. $(2x^2 + y^2)^6$ |
| 23. $(x^2 - y^2)^3$ | 24. $(2b + c)^4$ | 25. $(3m - 2n)^5$ | 26. $(x^3 - y^4)^6$ |

Expand each binomial.

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|-------------------|---------------------|------------------|
| 27. $(x + 1)^7$ | 28. $(x + 4)^8$ | 29. $(x - 3y)^6$ |
| 30. $(x + 2)^5$ | 31. $(x^2 - y^2)^5$ | 32. $(3 + y)^5$ |
| 33. $(x^2 + 3)^6$ | 34. $(x - 5)^7$ | 35. $(x - 4y)^4$ |