

In expanded Mayan form, we need $(7 \cdot 20^1) + (17 \cdot 20^0)$ stacked one on top of the other.



Skill Check Answers

1. 2,199,270 2. 1312

7.1 Exercises

✓ CONCEPT CHECK

1. The Hindu-Arabic numeral system uses _____ unique symbols to represent all numbers. In contrast, the Babylonian system used only _____ unique symbols, and the Mayan system used _____ unique symbols.
2. For numbers larger than 59, the Babylonian numeral system uses multiples of _____ when writing numbers.
3. When writing the Mayan numeral system, multiples of _____ are used.
4. It is widely believed that the Mayan system was the first numeral system to have a symbol to represent _____.

💡 PRACTICE

Express the Hindu-Arabic numeral in expanded form.

- | | |
|----------|-------------|
| 5. 2305 | 6. 4072 |
| 7. 621.9 | 8. 58.63 |
| 9. 80.02 | 10. 710.833 |

Express the expanded form as a Hindu-Arabic numeral.

11. $(9 \cdot 10^2) + (5 \cdot 10^1) + (4 \cdot 10)$

12. $(2 \cdot 10^4) + (8 \cdot 10^3) + (8 \cdot 10^2) + (1 \cdot 10^1) + (7 \cdot 1)$

13. $(3 \cdot 10^5) + (6 \cdot 10^1) + (2 \cdot 1)$

14. $(5 \cdot 10^3) + (5 \cdot 1)$

15. $(1 \cdot 10^4) + (2 \cdot 10^2) + (7 \cdot 10^{-2})$

16. $(4 \cdot 10^2) + (2 \cdot 10^1) + (3 \cdot 10^{-1})$

Write each Babylonian numeral as a Hindu-Arabic numeral.

17.

18.

19.

20.

21.

22.

Write each Hindu-Arabic numeral as a Babylonian numeral.

23. 12

24. 37

25. 99

26. 175

27. 4270

28. 8731

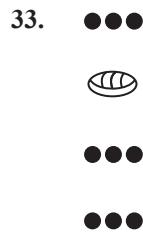
Write each Mayan numeral as a Hindu-Arabic numeral.

29.

30.

31.

32.



Write each Hindu-Arabic numeral as a Mayan numeral.

35. 15

36. 19

37. 192

38. 261

39. 1335

40. 4807

41. Write the current calendar year using the Babylonian numeral system and then using the Mayan numeral system.

 **WRITING & THINKING**

- 42. List any advantages or disadvantages there might be to using the Babylonian numeration system.
- 43. List any advantages or disadvantages there might be to using the Mayan numeration system.
- 44. Which numeration system would you prefer to use, the Babylonian system or the Mayan system? Discuss why.
- 45. Since the original Babylonian system did not use a symbol or place holder for 0, how do you think they were able to represent the number 60?
- 46. Suppose an ancient manuscript was found that included the Babylonian numeral $\nabla\nabla$. The text around the numeral suggests that the manuscript documents a convening of a particular country's government officials and that the number is a record of how many officials were in attendance. Based on the text, how many officials were probably in attendance at the convening?