

Unit Digits, Exponents, & Remainder Problems

- What is the tens digit of 6^{17} ?
(A) 1
(B) 3
(C) 5
(D) 7
(E) 9
- If you divide 7^{131} by 5, which remainder do you get?
A. 0
B. 1
C. 2
D. 3
E. 4
- If n is a positive integer, what is the remainder when $3^{8n+3} + 2$ is divided by 5?
A. 0
B. 1
C. 2
D. 3
E. 4
- What is the unit's digit of $7^{75} + 6$?
A. 1
B. 3
C. 5
D. 7
E. 9
- If n is a positive integer, what is the remainder when $3^{8n+3} + 2$ is divided by 5?
A. 0
B. 1
C. 2
D. 3
E. 4

6. What is the units digit of 73^{350}

- A) 3
- B) 5
- C) 6
- D) 7
- E) 9

7. What is the unit's digit of $7^{75} + 6$?

- (A) 1
- (B) 3
- (C) 5
- (D) 7
- (E) 9

8. When 51^{25} is divided by 13, the remainder obtained is:

- A. 12
- B. 10
- C. 2
- D. 1
- E. 0

9. What is the last digit of 3^{3^3} ?

- (A) 1
- (B) 3
- (C) 6
- (D) 7
- (E) 9

10. Which of the following numbers is prime?

- A. $2^{16} + 1$
- B. $2^{31} + 3^{31}$
- C. $4^{66} + 7^{66}$
- D. $5^{82} - 2^{82}$
- E. $5^{2881} + 7^{2881}$

11. What is the remainder when 43^{86} is divided by 5?

- A. 0

- B. 1
- C. 2
- D. 3
- E. 4

12. What is the remainder when $43717^{(43628232)}$ is divided by 5?

- (A) 1
- (B) 2
- (C) 3
- (D) 4
- (E) 5

13. If $n = (33)^{43} + (43)^{33}$ what is the units digit of n ?

- A. 0
- B. 2
- C. 4
- D. 6
- E. 8

14. What is the units digit of $2222^{(333)} \cdot 3333^{(222)}$?

- A. 0
- B. 2
- C. 4
- D. 6
- E. 8

15. What is the remainder of $(3^{7^{11}})/5$

- A. 0
- B. 1
- C. 2
- D. 3
- E. 4

16. What is the remainder when $32^{32^{32}}$ is divided by 7?

- A. 5
- B. 4
- C. 2
- D. 0
- E. 1

17. What is the units digit of $(173)^4 - 1973^2$

- A) 0
- B) 2
- C) 4
- D) 6
- E) 8

18. What is the remainder when 333^{222} is divided by 7?

- A. 3
- B. 2
- C. 5
- D. 7
- E. 1

19. What is the remainder when $(18^{22})^{10}$ is divided by 7?

- A. 1
- B. 2
- C. 3
- D. 4
- E. 5

20. If k is a positive integer, What is the remainder when 2^k is divided by 10?

- (1) k is divisible by 10
- (2) k is divisible by 4

21. If x is a positive integer, is the remainder 0 when $3^x + 1$ is divided by 10?

- (1) $x = 4n + 2$, where n is a positive integer.
- (2) $x > 4$

22. If $243^x \cdot 463^y = n$, where x and y are positive integers, what is the units digit of n ?

- (1) $x + y = 7$
- (2) $x = 4$

23. If r , s , and t are all positive integers, what is the remainder when 2^{rst} is divided by 10?

- (1) s is even
- (2) $rs = 4$

24. If $357^x * 117^y = a$, where x and y are positive integers, what is the units digit of a ?

(1) $100 < y^2 < x^2 < 169$

(2) $x^2 - y^2 = 23$

25. If x and y are positive integers, what is the remainder when $3^{(4 + 4x)} + 9^y$ is divided by 10?

(1) $x = 25$.

(2) $y = 1$.