Factoring 2

1. How many positive integers factors does 720000 have?
   A. 30   B. 60   C. 120
   D. 240   E. NOTA

2. With how many zeros does 50! end?
   A. 10   B. 12   C. 20
   D. 50   E. NOTA

3. Convert 12345_6 to base 10.
   A. 120   B. 90   C. 1865
   D. 710   E. NOTA

4. Find the sum of the GCF and the LCM of the following numbers: 20, 30, 40, 50 and 60.
   A. 810   B. 730   C. 1610
   D. 790   E. NOTA

5. How many positive integer factors does the number 21168 have?
   A. 50   B. 60   C. 70
   D. 80   E. NOTA

6. How many prime numbers are less that 100?
   A. 24   B. 25   C. 26
   D. 27   E. NOTA

7. Find the sum of the positive proper integral factors of 512.
   A. 256   B. 511   C. 512
   D. 1023   E. NOTA

8. Find 2185 in base 7.
   A. 817   B. 1426   C. 5572
   D. 6241   E. NOTA

9. How many positive integers less than 50 have exactly two proper divisors?
   A. 4   B. 5   C. 15
   D. 16   E. NOTA

11. Give the simplified value of $\dfrac{8}{11}+\dfrac{8}{99}-\dfrac{8}{9}$
   A. $-\dfrac{8}{99}$ B. $\dfrac{8}{101}$ C. $\dfrac{512}{9801}$
   D. $\dfrac{168}{99}$ E. NOTA

12 P = the greatest common factor of 5 and 12
    Q = the least common multiple of 6 and 13
    R = the arithmetic mean of P and Q
    What is the value of 3R?

    A. 39.5   B. 91.5   C. 120
    D. 207   E. NOTA

13 In how many zeros does 3124! end?
    A. 580   B. 776   C. 780
    D. 3124   E. NOTA

14 How many positive even integral factors exist for the number 1224?
    A. 8   B. 16   C. 18
    D. 24   E. NOTA

15 Find the units digit of $119^{31} - 112^{29} + 683^{117}$
    A. 0   B. 4   C. 7
    D. 9   E. NOTA

16. Find $726_8 - 221_3$ in base 7
    A. 445_7 B. 547_7 C. 1411_7
    D. 1204_7 E. NOTA

17 How many zeros are at the end of 2005! ?
    A. 500   B. 497   C. 222
    D. 401   E. NOTA

18 How many of the positive integrals factors of 4320 are multiples of 3?
    A. 30   B. 16   C. 48
    D. 36   E. NOTA

19. Write the decimal number 150 in binary notation.
    A. 1100 0101   B. 1000 0101   C. 1010 0001
    D. 1001 0110   E. NOTA

20. Who am I? The sum of my factors, excluding me, is equal to me. I am less than 30 but my square is
    not. Find $(Me)^3 - (Me)^2$
    A. 7   B. 252   C. 180
    D. 6   E. NOTA

21 Simplify $\dfrac{729^{334}}{81^{500}}$

   A. 3   B. 81   C. 14, 348, 907

   D. 3, 486, 784, 401   E. NOTA

22 Find the units digit of the following expressioni:

$686^{304} - 787^{306} + 989^{308}$

   A. 2   B. 3   C. 4

   D. 8   E. NOTA

23 Simplify: $\dfrac{\left(x^2\right)^3\left(y^4\right)^2\left(x^2y\right)^3 xy}{\left(xy\right)^5 xy\left(x^2y^2\right)}$

   A. x^3y^2 B. x^4y^2 C. x^5y^4

   D. x^5y^5 E. NOTA

24 What is the sum of the digits of $2^{34}\cdot 5^{37}$

   A. 7   B. 8   C. 24

   D.   E. NOTA

25 How many zeros are at the end of (8!)(25!)

   A. 5   B. 6   C. 7

   D. 8   E. NOTA

26 2005 has 2 prime factors. How many positive factors exist for 2005^{2005}

   A. 2007   B. 2005^2 C. 4010

   D. 2006^2 E. NOTA

Short Answer

27 What is the smallest positive integer that is **not** a factor of

$1\times2\times3\times4\times5\times6\times7\times8\times9\times10\times11\times12\times13\times14\times15\times16\times17\times18\times19\times20$?

28 Which is larger, 2^{3000} or 3^{2000}

29 The integers from 1 to 200 contain a sequence of 13 consecutive **composite** numbers. What is the smallest number in that sequence?

30 When the integer n is divided by 7, the remainder is 5. What is the remainder when $2n$ is divided by 7?