

Factoring 3
NO CALCULATORS

Short Answer Questions 17-28 are worth DOUBLE

1. Express $8^x \cdot 2^{1-3x}$ in simplest form.
A. 2
B. 2^{6x-1}
C. 2^{3x-9x^2}
D. 16^{x-3x^2}
E. NOTA

2. If $\frac{1}{3x} + \frac{2}{5x} = 11$ then $\frac{1}{x} =$
A. 15
B. 3
C. $\frac{1}{3}$
D. $\frac{1}{15}$
E. NOTA

3. Simplify $2^{n+1} \cdot 2^{n-3} \cdot 2^{5n}$
A. 2^{7n-2}
B. 2^{7n-4}
C. 2^{6n-2}
D. 2^{6n-4}
E. NOTA

4. Find the greatest common factor of $2x^2y^3z$ and $4x^5y^2$.
A. xyz
B. $2x^2y^2$
C. $2x^5y^3z$
D. $4x^5y^3z$
E. NOTA

5. What is the units digit of 2004^{2004} ?
A. 0
B. 2
C. 4
D. 6
E. NOTA

6. Which of the following is NOT divisible by 3?
A. 318762951572
B. 318762955401
C. 318762958362
D. 318762955404
E. NOTA

7. Find the units digit of 7^{2004} .
A. 7
B. 9
C. 3
D. 1
E. NOTA

8. Convert 3030_6 to base 10.
A. 666
B. 524
C. 22010
D. 830
E. NOTA

9. Find the greatest common factor of 180 and 1386.
A. 5220
B. 36
C. 18
D. 9
E. NOTA

Short Answer

17 If $4^m = 16^6$ and $\left(\frac{1}{4}\right)^n = 8^2$, find mn .

18 Simplify $\frac{27^{2x} \cdot 9^{3x}}{81^{3x}}$

19 Consider the following statements. Write the letter of each true statement.

A) 0 is a prime number

B) 1 is a prime number

C) 2 is a prime number

D) A number divided by zero is undefined.

E) $0^0 = 1$

F) $0! = 1$

G) $\frac{0}{0} = 1$

H) $2^0 = 0$

I) $0^2 = 1$

20 Let A = the least common multiple of 3, 15 and 51
Let B = the greatest common factor of 14, 91 and 98

Find the value of $\frac{7A}{225B}$

- 21 A certain 3-digit number has the following characteristics:
The value of the number is 28 times the sum of the three digits.
The units digit and the hundreds' digit are the same.
The ten's digit is one more than the sum of the other two digits.
What is the 3-digit number?
- 22 How many factors of 7 does $34!$ have?

Consider the number $N = 63000$.

- 23) How many integral factors does N have?
24) How many of the factors of N have a units digit of zero?
25) How many of the factors of N are multiples of 6?
26) How many of the factors of N have a units digit of 5?
27) How many of the factors of N have a digital sum which is a multiple of 3?
28) How many of the factors of N end in two zeros?