1

If x, y, and z are positive integers and 3x = 4y = 7z, then the least possible value of x + y + z is

A. 33
B. 40
C. 49
D. 61
E. 84

2

Coins are to be put into 7 pockets so that each pocket contains at least one coin. At most 3 of the pockets are to contain the same number of coins, and no two of the remaining pockets are to contain an equal number of coins. What is the least possible number of coins needed for the pockets?

A. 7
B. 13
C. 17
D. 22
E. 28

3

In a class of 30 students, 2 students did not borrow any books from the library, 12 students each borrowed 1 book, 10 students each borrowed 2 books, and the rest of the students each borrowed at least 3 books. If the average (arithmetic mean) number of books borrowed per student was 2, what is the maximum number of books that any single student could have borrowed ?

A. 3
B. 5
C. 8
D. 13
E. 15

4

If the population of city A is increased by A% in year 2006 from year 2005 and b% in 2007 from year 2006. If a+b=20, then what is the maximum percentage increase in population of city A from 2005 to year 2007?

A. 20.19%
B. 20.36%
C. 20.51%
D. 20.84%
E. 21%

5

A cyclist travels the length of a bike path that is 225 miles long, rounded to the nearest mile. If the trip took him 5 hrs, rounded to the nearest hour, then his average speed must be between:

A. 38 and 50 mph
B. 40 and 50 mph
C. 40 and 51 mph
D. 41 and 50 mph
E. 41 and 51 mph

6

Four carpenters can individually complete a particular task in 3, 4, 5, and 7 hours, respectively. What is the maximum fraction of the task that can be completed in forty-five minutes if three of the carpenters work together at their respective rates ?

A. 11/15
B. 3/5
C. 11/30
D. 47/80
E. 5/9

7

If 5400mn = k^4, where m, n, and k are positive integers, what is the least possible value of m + n?

A. 11
B. 18
C. 20
D. 25
E. 33

8

In a company with 48 employees, some part-time and some full-time, exactly (1/3) of the part-time employees and (1/4) of the full-time employees take the subway to work. What is the greatest possible number of employees who take the subway to work?

A. 12
B. 13
C. 14
D. 15
E. 16

9

Of the 200 employees in a certain company, 25 percent will be relocated to City X and the remaining 75 percent will be relocated to City Y. However, 40 percent of the employees prefer City Y and 60 percent prefer City X. What is the highest possible number of employees who will be relocated to the city they prefer?

(A) 65
(B) 100
(C) 115
(D) 130
(E) 135

10

Of the science books in a certain supply room, 50 are on botany, 65 are on zoology, 90 are on physics. 50 are on geology, and 110 are on chemistry. If science books are removed randomly from the supply room, how many must be removed to ensure that 80 of the books removed are on the same science?

A. 81
B. 159
C. 166
D. 285
E. 324