

## NMC SAMPLE PROBLEMS: GRADE 5

1. Wonjung is riding a bike at the speed of 300 m/min. This speed equals to  cm/sec. What number should be in the box?

(a) 50                      (b) 300                      (c) 500                      (d) 3000                      (e) 5000

*Answer:* (c)

2. Which of the following has the largest value?

(a)  $4.01 \times 6.98$                       (b)  $11.43 + 16.5$                       (c)  $14\frac{3}{5} + 13\frac{3}{5}$   
(d)  $280 \div 10.27$                       (e)  $(13 + 7) \times \frac{7}{5}$

*Answer:* (c)

3. If 4 more than twice a number is 28, what is the number?

(a) 10                      (b) 11                      (c) 12                      (d) 13                      (e) 14

*Answer:* (c)

4. Which of the following is equal to  $95 \times 33$ ?

(a)  $(95 \times 30) + (95 \times 3)$                       (b)  $(90 \times 30) + (5 \times 3)$                       (c)  $(95 \times 30) + (5 \times 33)$   
(d)  $(95 \times 3) + (95 \times 3)$                       (e)  $(90 \times 30) + (95 \times 33)$

*Answer:* (a)

5. What is the value of  $n$  for  $11 + 22 + 33 + 44 + 55 = 11 \times n$ ?

(a) 15                      (b) 16                      (c) 17                      (d) 18                      (e) 19

*Answer:* (a)

6. For example, 3 is the ones digit of 53. What is the ones digit of the following product?

$$(7 \times 7 \times 7 \times 7 \times 7) \times (7 \times 7 \times 7 \times 7 \times 7) \times (7 \times 7 \times 7 \times 7 \times 7) \times (7 \times 7 \times 7 \times 7 \times 7)$$

(a) 1                      (b) 2                      (c) 3                      (d) 7                      (e) 9

*Answer:* (a)

7. If  $2^3 + 2^3 + 2^3 + 2^3 = 2^n$ , what is  $n$ ?

(a) 4                      (b) 5                      (c) 6                      (d) 7                      (e) 8

*Answer:* (b)

8. What is the difference between  $(1 + 2 + 3 + 4 + \dots + 49 + 50)$  and  $(51 + 52 + 53 + 54 + \dots + 99 + 100)$ ?
- (a) 250                      (b) 750                      (c) 1250                      (d) 2500                      (e) 5050  
*Answer: (d)*
9. After spending  $\frac{2}{5}$  of his salary, a man has \$801 left. What is his salary in dollars?
- (a) \$1,330                      (b) \$1,333                      (c) \$1,335                      (d) \$1,337                      (e) \$1,339  
*Answer: (c)*
10. 51 is what percent of 60?
- (a) 75%                      (b) 80%                      (c) 85%                      (d) 90%                      (e) 95%  
*Answer: (c)*
11. There are 20 animals available for adoption at PetSmart, 12 dogs and 8 cats. If Wilson wishes to adopt two animals, how many ways can he choose 1 dog and 1 cat?
- (a) 20                      (b) 24                      (c) 80                      (d) 96                      (e) None of These  
*Answer: (d)*
12. An artist wants to paint a picture on a canvas where the length of the canvas is 6 inches more than twice the width. If the total perimeter of the canvas is 108 inches, what is the length of the canvas (in inches)?
- (a) 16                      (b) 30                      (c) 38                      (d) 54                      (e) None of These  
*Answer: (c)*
13. There is a garden that is shaped as a rectangle with size 30 feet by 40 feet. And there is a sidewalk around the garden that is 3 feet wide. What is the outside perimeter of the sidewalk, in feet?
- (a) 76                      (b) 82                      (c) 140                      (d) 152                      (e) 164  
*Answer: (e)*
14. 70 students took a math exam. 10% of them scored at least 90 points, 20% scored at least 80 but less than 90 points. How many students have scored less than 80 points?
- (a) 14                      (b) 21                      (c) 28                      (d) 49                      (e) 56  
*Answer: (d)*
15. The average of Sue's three tests is 85. Each test is worth 100 points. What score does she have to make on her 4th test to get an average of 87?
- (a) 87                      (b) 90                      (c) 93                      (d) 95                      (e) 97  
*Answer: (c)*

16. A cubic number is of the form  $n^3$  for some natural number  $n$ . For example, 8 is a cubic number because  $8 = 2 \times 2 \times 2 = 2^3$ . How many cubic numbers exist between 2 and 999?  
(a) six                      (b) seven                      (c) eight                      (d) nine                      (e) ten  
*Answer: (c)*
17. There are 6 people in a room and each person shakes hands with every other person exactly one time. How many handshakes will there be?  
(a) 10                      (b) 15                      (c) 18                      (d) 24                      (e) 30  
*Answer: (b)*
18. Jiyun has a total of \$41.00, consisting of an equal number of quarters, dimes, nickels, and pennies. How many coins does she have in all?  
(a) 10                      (b) 40                      (c) 100                      (d) 200                      (e) 400  
*Answer: (e)*
19. Sean has 10 coins each of the following: dollars, quarters, dimes, nickels, and pennies. If he pays for three pens which cost 62 cents each by these coins, what is the least number of coins he can use?  
(a) 5                      (b) 6                      (c) 7                      (d) 8                      (e) 9  
*Answer: (b)*
20. A group of students in a gym are standing on a circle. They are evenly spaced and are numbered in order starting with 1. If the student with number 7 is directly across from the student with number 18, how many students are there in the group?  
(a) 22                      (b) 20                      (c) 19                      (d) 18                      (e) 17  
*Answer: (a)*
21. John divided his souvenir hat pins into two piles. The two piles had an equal number of pins. After John gave his brother one-half of one-third of one pile, he had 66 pins left. How many pins did John give to his brother?  
(a) 3                      (b) 6                      (c) 8                      (d) 11                      (e) 22  
*Answer: (b)*
22. Two hundred 5<sup>th</sup> graders are going on a field trip with 10 teachers and 5 patrons. If each bus can hold 40 people in addition to the bus driver, how many buses are needed and how many seats will be empty?  
(a) 5 buses, no empty seat                      (b) 5 buses, 15 empty seats                      (c) 5 buses, 25 empty seats  
(d) 6 buses, 15 empty seats                      (e) 6 buses, 25 empty seats  
*Answer: (e)*

- 23.** There are 30 students on a school bus. 10 students wear hats. 12 students wear eye glasses. Only five students wear both eye glasses and hats. How many students wear neither hats nor eye glasses?
- (a) 7                      (b) 13                      (c) 15                      (d) 17                      (e) 23
- Answer:* (b)
- 24.** The sum of three consecutive whole numbers is 2010. What is the largest number among the three numbers?
- (a) 665                      (b) 667                      (c) 669                      (d) 670                      (e) 671
- Answer:* (e)
- 25.** When a positive whole number is divided by 7, the remainder is 2. When the same number is divided by 5, the remainder is also 2. What is the least possible number?
- (a) 30                      (b) 37                      (c) 44                      (d) 65                      (e) 72
- Answer:* (b)
- 26.** If a train departed Boston at 9:45 a.m. and arrived at New York City at 1:25 p.m., how long did the trip take?
- (a) 4 hours 15 minutes                      (b) 4 hours 40 minutes                      (c) 3 hours 15 minutes  
(d) 3 hours 30 minutes                      (e) 3 hours 40 minutes
- Answer:* (e)
- 27.** There are three clocks that bell every 4 minutes, 6 minutes, and 10 minutes, respectively. If all three clocks bell together at 3:00 p.m., when will they bell all together next time?
- (a) 3:30 p.m.                      (b) 3:40 p.m.                      (c) 4:00 p.m.                      (d) 5:00 p.m.                      (e) 7:00 p.m.
- Answer:* (c)
- 28.** There are 5 strawberry candies for every 3 chocolates. If there is a total of 64 strawberry candies and chocolates, what is the number of chocolates?
- (a) 24                      (b) 22                      (c) 20                      (d) 32                      (e) 40
- Answer:* (a)
- 29.** Jihyun needs 50 slices of pizza for a party. If each pizza is cut into 8 slices, at least how many pizzas does she need?
- (a) 4                      (b) 5                      (c) 6                      (d) 7                      (e) 8
- Answer:* (d)

- 30.** At a party, if Sungho gives 1 candy to each guest, 10 candies would be left over. If he gives 2 candies to each guest, 4 more candies would be needed. What is the number of guests?
- (a) 10                      (b) 14                      (c) 16                      (d) 18                      (e) 20
- Answer: (b)*
- 31.** Hyunah is 4 years older than her younger sister. If the sum of their ages is 20, what is Hyunah's age?
- (a) 6                      (b) 8                      (c) 10                      (d) 12                      (e) 14
- Answer: (d)*
- 32.** Joan was 6<sup>th</sup> in a line. Amy was 8<sup>th</sup> in the same line but counted from the opposite end of the line. If there were 3 children between Joan and Amy, how many children were in the line?
- (a) 11                      (b) 14                      (c) 17                      (d) 18                      (e) 20
- Answer: (c)*
- 33.** Michelle wants to fence a rectangular area for her dog. The area to be fenced is 40 feet long and 35 feet wide. If there is a fence post at each corner and the fence posts are placed 5 feet apart, how many posts will she need?
- (a) 29                      (b) 30                      (c) 31                      (d) 32                      (e) 34
- Answer: (b)*
- 34.** Insoo wants to fence a rectangular area of 16 m<sup>2</sup> for his dog. If the length and the width of the rectangular area are whole numbers in meter, what is the least possible perimeter in meters ?
- (a) 8                      (b) 12                      (c) 14                      (d) 16                      (e) 20
- Answer: (d)*
- 35.** How many whole numbers between 10 and 100 have digit 7 only once?
- (a) Fifteen                      (b) Sixteen                      (c) Seventeen  
(d) Eighteen                      (e) Nineteen
- Answer: (c)*
- 36.** The number below is formed by concatenating whole numbers from 1 to 50.
- 1234567891011121314 ··· 4950
- The 11<sup>th</sup> digit from the left is 0. What is the 50<sup>th</sup> digit from the left?
- (a) 0                      (b) 1                      (c) 2                      (d) 3                      (e) 4
- Answer: (d)*

37. In a math team that consists of only seniors and juniors, 12 are seniors, 10 girls, 7 senior girls, and 4 junior boys. How many seniors and juniors are in the math team?  
(a) 24                      (b) 22                      (c) 20                      (d) 19                      (e) 18  
*Answer: (d)*
38. If we throw three dice that have numbers 1 to 6 on their surfaces and add numbers on each top, how many different sums can we get?  
(a) 14                      (b) 15                      (c) 16                      (d) 17                      (e) 18  
*Answer: (c)*
39. A square number is a whole number that is the product of some whole number with itself. For example, 9 is a square number because it can be written as  $3 \times 3$ . What is the least square number that is a multiple of 12?  
(a) 16                      (b) 36                      (c) 144                      (d) 324                      (e) 576  
*Answer: (b)*
40. If we rearrange the digits of 1234 to form 4 digit numbers, how many different numbers that are greater than 4000 can we make?  
(a) 6                      (b) 8                      (c) 12                      (d) 18                      (e) 24  
*Answer: (a)*
41. The total number of red, blue, and yellow marbles in a jar is 24. The number of red marbles is 3 times the number of blue marbles. If the number of yellow marbles is divisible by 6, what is the number of red marbles?  
(a) 3                      (b) 4                      (c) 6                      (d) 9                      (e) 12  
*Answer: (d)*
42. If the ratio of boys and girls in a club is 5:8, which of the following is a possible number of students in the club?  
(a) 28                      (b) 32                      (c) 36                      (d) 38                      (e) 39  
*Answer: (e)*
43. If all club members attend a meeting, the ratio of boys and girls in a club is 6:5. If 2 boys and 5 girls are absent from a meeting, the ratio of boys and girls becomes 2:1. How many boys are in the club when everyone attend a meeting?  
(a) 6                      (b) 8                      (c) 10                      (d) 12                      (e) 18  
*Answer: (d)*

44. A reading club meets on the third Sunday of every month. What is the latest possible day of the month that this meeting could take place?

(a) 16                      (b) 21                      (c) 22                      (d) 23                      (e) 28

*Answer:* (b)

45. Hansol counted numbers backward from 1000 by 6's as shown below.

1000, 994, 988, 982, ...

Which of the following can be a number he counted?

(a) 1                      (b) 2                      (c) 3                      (d) 4                      (e) 5

*Answer:* (d)

46. If the average of five different positive whole numbers is 20 and the least value of the numbers is 15, what is the greatest possible value of the numbers?

(a) 20                      (b) 24                      (c) 30                      (d) 34                      (e) 66

*Answer:* (d)

47. Jeana is selecting socks randomly from a drawer that contains 4 white socks, 5 blue socks, and 6 yellow socks, and no other socks. What is the least number of socks that she must select to ensure that she always gets two socks of the same color?

(a) 4                      (b) 5                      (c) 6                      (d) 7                      (e) 8

*Answer:* (a)

48. The distance between points  $A$  and  $B$  is 10. The distance between points  $B$  and  $C$  is 15. What is the longest distance possible between  $A$  and  $C$ ?

(a) 23                      (b) 24                      (c) 25                      (d) 26                      (e) 27

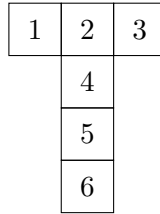
*Answer:* (c)

49. A wooden cube is painted red and then cut into 27 identical smaller cubes. How many of these cubes are painted red on only one face?

(a) 6                      (b) 8                      (c) 10                      (d) 12                      (e) 16

*Answer:* (a)

50. The following figure shows a piece of paper that can be folded up to form a cube. What numbered face will be opposite to the number 5 face when folded?



- (a) 1                      (b) 2                      (c) 3                      (d) 4                      (e) 6

*Answer:* (b)

51. What is the sum of all possible 3-digit numbers that can be made from the numbers 1, 2, and 3? (No digit is repeated.)

*Answer:* 1332

52. How many different 4-digit numbers can be constructed using the digits 0, 1, 2, and 3?

*Answer:* 18

53. Peter and Tom are 10 km apart, and begin to walk to each other at the same time. If Peter walks 4 km/hour and Tom walks 2 km/hour, how many minutes will it take for them to meet?

*Answer:* 100 minutes