NMC Sample Problems: Grade 5

1. $\dfrac{1\times 3\times 5}{2\times 6\times 10}\times\dfrac{8\times 9}{5\times 6}=?$

(a) $\dfrac{3}{10}$ (b) $\dfrac{4}{15}$ (c) $\dfrac{8}{15}$ (d) $\dfrac{3}{20}$ (e) $\dfrac{6}{25}$

2. What is the value of $\dfrac{5}{6}-\dfrac{3}{4}+\dfrac{2}{3}-\dfrac{1}{2}$?

(a) $-\dfrac{1}{4}$ (b) $\dfrac{1}{4}$ (c) $\dfrac{3}{4}$ (d) $-\dfrac{1}{12}$ (e) $\dfrac{5}{12}$

3. What is the value of $23,456+15,743-3,894$ expressed to the nearest thousand?

(a) $34,000$ (b) $34,300$ (c) $35,000$ (d) $35,300$ (e) $36,000$

4. Which of the following numbers is closest to 15?

(a) 14.809 (b) 14.91 (c) 15.1 (d) 15.06 (e) 15.009

5. Which of the following is equal to 95×33?

(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) $(90\times 30)+(95\times 33)$

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

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

7. For two positive whole numbers, their sum is 11 and their product is 24. What is the larger number?

(a) 3 (b) 4 (c) 6 (d) 8 (e) 12

8. If Jungho runs $1\dfrac{1}{4}$ miles every day, how many miles does he run in 20 days?

(a) 5 (b) 10 (c) 15 (d) 20 (e) 25

9. Juhee did babysitting for 3 hours a day, 5 days a week for 8 weeks over the summer. How many hours did she work for the babysitting?

(a) 16 (b) 40 (c) 64 (d) 120 (e) 125

10. How many minutes are there in one day?

(a) 24 (b) 144 (c) 720 (d) 1440 (e) 7200

11. 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

12. What is the difference between $(1+2+3+4+\cdots+49+50)$ and $(51+52+53+54+\cdots+99+100)$?

(a) 250 (b) 750 (c) 1250 (d) 2500 (e) 5050

13. The sum of five consecutive whole numbers is 2015. What is the smallest number among the five numbers?

(a) 401 (b) 402 (c) 403 (d) 404 (e) 405

14. A gallon of fat-free milk cost \$3.98. If it cost 5% less a year ago, how much did it cost a year ago?

(a) 3.65 (b) 3.78 (c) 3.81 (d) 4.06 (e) 4.18

15. If 30% of 20 is same as 50% of x, what is the value of x?

(a) 5 (b) 6 (c) 8 (d) 12 (e) 15

16. Jihyun needs 50 slices of pizza for a party. If each pizza is cut into 8 slices, at least how many pizza does she need?

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

17. Yuna uses 3 pounds of meat to make 8 hamburgers for her family. How many pounds of meat does she need to make 24 hamburgers for a neighborhood picnic?

(a) 6 (b) $6\frac{2}{3}$ (c) $7\frac{1}{2}$ (d) 8 (e) 9

18. Jisung divided his souvenir hat pins into two piles. The two piles had an equal number of pins. After Jisung gave his brother two-thirds of one pile, he had 24 pins left. How many pins did Jisung give to his brother?

(a) 8 (b) 9 (c) 10 (d) 11 (e) 12

19. Chanho puts some of his marbles into red and blue jars. First, he puts a half of the total marbles into the red jar. Then, he puts $\frac{1}{3}$ of the remaining marbles into the blue jar. If there are 12 remaining marbles, what is the total number of Chanho's marbles?

(a) 12 (b) 20 (c) 24 (d) 36 (e) 42

20. Wonjung is riding a bike at the speed of 300 m/min. This speed equals to _?_ cm/sec.

(a) 30 (b) 300 (c) 500 (d) 3000 (e) 5000

21. Which of the following has the largest value?

(a) 4.01×6.98 (b) $11.43 + 16.5$ (c) $14\frac{3}{5} + 13\frac{2}{3}$ (d) $280 \div 10.27$ (e) $(13 + 7) \times \frac{7}{5}$

22. What is the digit in the ones place of the following?

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

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

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

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

24. A cubic number is of the form m^3 for some natural number m. 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

25. Find how many pairs of positive integers add up to 100. For example, there are three pairs of positive integers add up to 6:

$$1 + 5 = 6 \qquad 2 + 4 = 6 \qquad 3 + 3 = 6$$

(a) 48 pairs (b) 50 pairs (c) 52 pairs (d) 58 pairs (e) 60 pairs

26. An artist wants to paint a picture on a canvas where the length of the canvas is 6 more inches 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

27. 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

28. 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

29. If the average of five distinct 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

30. 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

31. Sean has total 50 coins, 10 of each 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

32. 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

33. 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.

34. 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

35. 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

36. 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 need. What is the number of guests?

(a) 10 (b) 14 (c) 16
(d) 18 (e) 20

37. Hana is 4 years older than her younger sister. If the sum of their ages is 20, what is Hana's age?

(a) 6 (b) 8 (c) 10 (d) 12 (e) 14

38. Joan was the 6th in a line. Amy was the 8th 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

39. 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 any two consecutive fence posts are placed 5 feet apart each other, how many posts will she need?

(a) 29 (b) 30 (c) 31 (d) 32 (e) 34

40. The numbers below is formed by concatenating whole numbers from 1 to 50:

$$12345678910111213 14 \cdots 4950.$$

What is the 50th digit from the left? For example, the 11th digit from the left is 0.

(a) 0 (b) 1 (c) 2 (d) 3 (e) 4

41. 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

42. In a math team, there are 12 seniors, 10 girls, 7 senior girls, and 4 junior boys. What is the total number of seniors and juniors in the math team?

(a) 24 (b) 22 (c) 20 (d) 19 (e) 18

43. 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 divided by 6, what is the number of red marbles?

(a) 3 (b) 4 (c) 6 (d) 9 (e) 12

44. 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

45. 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

46. The digits 1, 2, 3, 4 and 5 are each used once to form the smallest possible five-digit even number. What is the digit in the tens place?

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

47. 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

48. 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

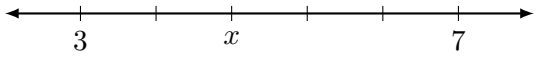
49. There are 6 people in a room and each person shakes hands with every other person exactly one time. How many handshakes will there be?

(a) 10 (b) 15 (c) 18 (d) 24 (e) 30

50. If we rearrange the digits 1, 2, 3 and 4 to form four-digit numbers, how many different numbers that are greater than 4000 can we make?

(a) 6 (b) 8 (c) 12 (d) 18 (e) 24

51. If the tick marks in the number line below are equally spaced, what is the value of x?



(a) $3\frac{2}{3}$ (b) $3\frac{3}{5}$ (c) $4\frac{2}{5}$ (d) $4\frac{3}{5}$ (e) $5\frac{2}{3}$

52. The perimeter of a square is 20 cm. What is the area of a square with twice that perimeter?

(a) 25 (b) 50 (c) 100 (d) 200 (e) 400

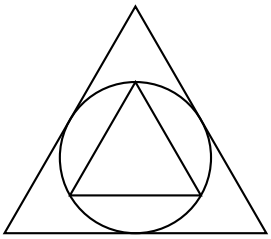
53. The distance between points A and B is 10. The distance between points B and C is 15. What is the longest distance possible between A and C?

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

54. If a triangle ABC has vertices $A(-1, 0)$, $B(3, 0)$ and $C(4, 6)$ in the xy-plane, what is the area of the triangle ABC?

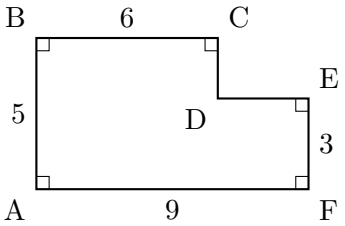
(a) 6 (b) 8 (c) 12 (d) 16 (e) 24

55. A circle is inscribed in a larger equilateral triangle, and a smaller equilateral triangle is inscribed in the circle as below. If the area of the larger triangle is 60, what is the area of the smaller triangle? (*Note: Figure not drawn to scale!*)



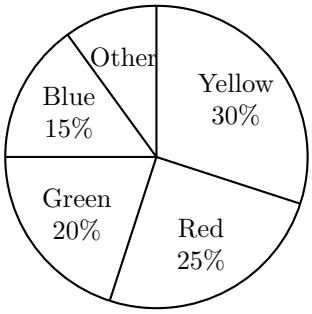
(a) 15 (b) 20 (c) 25 (d) 30 (e) 40

56. In the figure below, what is the area of the polygon $ABCDEF$ in square units? (*Note: Figure not drawn to scale!*)



(a) 33 (b) 36 (c) 37 (d) 39 (e) 42

57. The pie chart below shows the distribution of the number of items in different colors as a percent of the total number of items. If there are 100 red items, what is the number of items for "Other"? (*Note: Figure not drawn to scale!*)



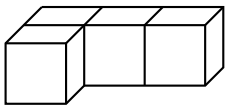
(a) 25 (b) 30 (c) 40 (d) 50 (e) 55

58. Hansol counted numbers backward from 1000 by 6's: 1000, 994, 988, 982, $\cdots$
What is the smallest positive number he counted?

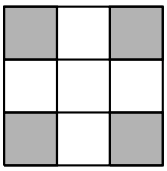
59. Peter and Tom are 10 km apart, and begin to walk to each other at the same time. If Peter walks 4 km/hour and Tom walks 2 km/hour, how many minutes will it take for them to meet?

60. There are two rectangular water tanks. The inner dimensions of the first tank are 60 cm long, 40 cm wide, and 20 cm high. The water level in the first tank is 10 cm high. The inner dimensions of the second tank are 30 cm long, 20 cm wide, and 50 cm high. The second tank is empty. If all of the water in the first tank is poured into the second tank, what is the height of the water in the second tank in centimeter (cm)?

61. Four unit cubes are glued together as shown below. If the length of each edge of a unit cube is one inch, what is the total surface area of this object in square inches? (Add all surface areas at top, bottom, and sides.)



62. A solid $3 \times 3 \times 3$ cube is composed of 27 unit cubes that are not painted. If each face of the $3 \times 3 \times 3$ cube is painted with gray paint as shown below, how many unit cubes are partially painted?



▷ KEYS ◁

[1] (a)
[2] (b)
[3] (c)
[4] (e)
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[7] (d)
[8] (e)
[9] (d)
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[11] (a)
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[55] (a)
[56] (d)
[57] (c)
[58] 4
[59] 100 minutes
[60] 40 cm
[61] 18
[62] 8