NMC SAMPLE PROBLEMS: GRADE 4

1. What is the digit in the tens place of the following sum: $47 + 89$?

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

Answer: (c)

2. Let a, b, and c be whole numbers satisfying: $1 < a < b < c < 7$ and $a \times c$ is odd. What is b?

(a) 2   (b) 3   (c) 4   (d) 5   (e) 6

Answer: (c)

3. Round 2.13 and 4.55 to the nearest whole numbers and add them. What is the sum of the rounded numbers?

(a) 3   (b) 4   (c) 5   (d) 6   (e) 7

Answer: (e)

4. Which of the following is not a divisor of 168?

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

Answer: (b)

5. If $5 \times 5 \times a = 175$, what is a?

(a) 5   (b) 6   (c) 7   (d) 8   (e) 9

Answer: (c)

6. What is the digit in the ones place of $9 + 9 + 9 + 9 + 9 + 9 + 9 + 9 + 9 + 9 + 9 + 9$?

(a) 6   (b) 7   (c) 8   (d) 9   (e) 10

Answer: (c)

7. What is the digit in the ones place of $7 \times 7 \times 7 \times 7 \times 7 \times 7 \times 7 \times 7 \times 7 \times 7 \times 7 \times 7$?

(a) 1   (b) 3   (c) 5   (d) 7   (e) 9

Answer: (a)

8. What is the remainder when 101010101 divided by 9?

(a) 0   (b) 1   (c) 3   (d) 5   (e) 7

Answer: (d)

9. Let a be a whole number greater than 2. If b is two times a, what is the greatest common divisor of a and b?

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

Answer: (b)

10. What is the least common multiple of 8 and 14?

(a) 16   (b) 22   (c) 28   (d) 48   (e) 56

Answer: (e)

11. Let a and b be whole numbers such that the least common multiple of a and b is 9. Which of the following cannot be true?

(a) $a \times b = 243$ (b) $a + b = 18$ (c) $a \times b = 81$ (d) $a + b = 10$ (e) $a \times b = 9$

Answer: (a)

12. A prime number (or a prime) is a positive whole number which is divisible by exactly two distinct whole numbers, 1 and itself. Let a and b be whole numbers, such that a is a prime and $a \times b = 30$. What is the least common multiple of a and b?

(a) 1   (b) 6   (c) 10   (d) 15   (e) 30

Answer: (e)

13. A positive whole number (other than 1) divisible by only 1 and itself is called prime. How many prime numbers are there between 10 and 20?

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

Answer: (d)

14. Which of the following is the largest?

(a) $1\frac{2}{3}$ (b) $1\frac{3}{4}$ (c) $\frac{5}{3}$ (d) $1 - \frac{1}{3}$ (e) $2 - \frac{1}{3}$

Answer: (b)

15. Which of the following is the smallest?

(a) -2 (b) -1.9 (c) -2.1 (d) $-2\frac{1}{3}$ (e) $-\frac{5}{3}$

Answer: (d)

16. Which set of fractions is ordered from greatest to least?

(a) $\frac{1}{2} > \frac{1}{3} > \frac{2}{5}$ (b) $\frac{1}{3} > \frac{1}{2} > \frac{2}{5}$ (c) $\frac{2}{5} > \frac{1}{3} > \frac{1}{2}$ (d) $\frac{2}{5} > \frac{1}{2} > \frac{1}{3}$ (e) $\frac{1}{2} > \frac{2}{5} > \frac{1}{3}$

Answer: (e)

17. Compute $1 - \frac{1}{2} + \frac{1}{3} - \frac{1}{4}$.

(a) $\frac{3}{24}$ (b) $\frac{5}{24}$ (c) $\frac{7}{24}$ (d) $\frac{5}{12}$ (e) $\frac{7}{12}$

Answer: (e)

18. If $\frac{x}{2} + \frac{x}{3} = \frac{5}{3}$, what is x?

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

Answer: (b)

19. Let a, b, and c be whole numbers satisfying: $0 \le a \le b \le c \le 8$; $a = b + c$; $a = -b + c$. What is c?

(a) 0   (b) 2   (c) 4   (d) 6   (e) 8

Answer: (a)

20. Let a, b, and c be whole numbers satisfying: $0 < a < b < c < 9$; $a \times b \times c$ is odd; $c - a$ is three times $b - a$. What is b?

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

Answer: (c)

21. If $a < 0$ and $b > 0$, then which of the following statements is always true?

(a) $a + b > 0$ (b) $a + b < 0$ (c) $a + b = 0$ (d) $a \times b > 0$ (e) $a \times b < 0$

Answer: (e)

22. Given the pattern
$$2, 4, 8, 16, 32, x$$
what is x?

(a) 48   (b) 54   (c) 60   (d) 64   (e) 68

Answer: (d)

23. Which of the following is the best fit for x in the following pattern: $22, 29, 36, x, 50, \cdots$?

(a) 43   (b) 44   (c) 45   (d) 46   (e) 47

Answer: (a)

24. What is 0.3 % of 10 dollars?

(a) 3 dollars   (b) 0.3 dollars   (c) 3 cents   (d) 0.3 cents   (e) 0.03cents

Answer: (c)

25. Sahn has \$120. He plans to spend 10% of it. How much will be left?

(a) \$100   (b) \$102   (c) \$104   (d) \$106   (e) \$108

Answer: (e)

26. In a classroom of 20 students, 60% of them voted in favor of a candidate. How many students voted in favor of the candidate?

(a) 12   (b) 13   (c) 14   (d) 15   (e) 16

Answer: (a)

27. What is the average of the following scores: 10, 80, 40, 10, 70, and 90?

(a) 50   (b) 55   (c) 60   (d) 65   (e) 70

Answer: (a)

28. Hana has 4 coins. The sum of all these coins is 50 cents. How many nickels does Hana have?

(a) 1   (b) 2   (c) 3   (d) 4   (e) *None*

Answer: (a)

29. Sahn took 5 coins out of his piggy bank filled with US coins: pennies, nickels, dimes, and quarters. Which of the following cannot be the money Sahn took out?

(a) 25 cents   (b) 50 cents   (c) 75 cents   (d) 1 dollar   (e) 1.25 dollars

Answer: (d)

30. Bada's mother is three times older than Bada. If Bada's mother is 36 years old, how old is Bada?

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

Answer: (c)

31. Sahn and Dule made 5 goals in a soccer game together. Bada and Sahn made 4 goals together in the same game. If Dule made 2 goals in the game, how many goals did Bada make?

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

Answer: (b)

32. Sahn is preparing for a big vocabulary test. He learns 15 new words every day. How many days will it take Sahn to learn all 105 words on his list?

(a) 5   (b) 6   (c) 7   (d) 8   (e) 9

Answer: (c)

33. There are 7 chairs, each of which has 4 legs. There are 4 tables, each of which has 3 legs. How many legs are there if we put all the chairs and tables together?

(a) 28   (b) 12   (c) 16   (d) 30   (e) 40

Answer: (e)

34. Sahn wants to donate books in his two bookshelves. The first bookshelf has 4 shelves with 16 novels on each shelf. The second bookshelf has 4 shelves with 14 science books on each shelf. Every book has the same size so Sahn evenly distributed those books into five boxes for packing. How many books will there be in each box?

(a) 64   (b) 56   (c) 120   (d) 24   (e) 12

Answer: (d)

35. Mr. McDonald sold 50 of his cows on the first day at a fair. He sold another 20 cows on the second day. He bought 35 new cows on the third day. Then, he had 130 cows in his ranch. How many cows did Mr. McDonald have in the beginning?

(a) 165   (b) 235   (c) 105   (d) 205   (e) 200

Answer: (a)

36. Uncle Tom served in the military for 45 months, and then he attended college for 4 years. How long did Uncle Tom spend in military and college?

(a) 49 months   (b) 83 months   (c) 7.25 years   (d) 7.5 years   (e) 7.75 years

Answer: (e)

37. Hana has 17 hours before her math exam. She plans to sleep for 8 hours, eat for 30 minutes three times, exercise for one hour and 30 minutes twice, practice piano for an hour, and play with her brother for 2 hours. How long can she study math?

(a) 5 hours and 30 minutes   (b) 4 hours and 30 minutes

(c) 3 hours and 30 minutes   (d) 2 hours and 30 minutes

(e) 1 hours and 30 minutes

Answer: (e)

38. Aunt Euna went to a community college for 18 months after graduating from her high school before transferring to a four year college. She attended the four year college for 3 years excluding her internship for 9 months. Then, she went to a graduate school for 2 years for her master degree, before she started her business. If there was no gap, how long did it take for Aunt Euna to start her business since she graduated from her high school?

(a) 23 months   (b) 32 months   (c) 6.5 years   (d) 7.25 years   (e) 11.25 years

Answer: (d)

39. Hana and Duna have shared a piano to practice everyday for a week, before a piano competition. They used the piano for 8 hours a day and Hana played the piano twice longer than Duna. How many hours could Hana practice the piano in the week before the competition?

(a) about 2 hours and 40 minutes   (b) about 5 hours and 20 minutes

(c) about 18 hours and 40 minutes   (d) about 27 hours and 20 minutes

(e) about 37 hours and 20 minutes

Answer: (e)

40.   There are 128 tennis players participating in a tennis tournament. Each player has only one match to play per day. Every player plays on the first day, only winners remain to play the next day, and so on. If the tournament started on April 1st, which of the following will be the date of the final match where only two players remain to play?

(a) April 6th   (b) April 7th   (c) April 8th   (d) June 3rd   (e) August 6th

Answer: (b)

41.   A soccer practice consists of 10 minutes of stretching and two 30 minute long games with a 15 minute break between each game. If the practice ended at 2:00 PM, what time did the practice start?

(a) $1:05$ PM   (b) $1:00$ PM   (c) $12:55$ PM   (d) $12:45$ PM   (e) $12:35$ PM

Answer: (e)

42.   At Hana's birthday party, two pizzas were served: one cheese and one pepperoni. Both were the same size, but the cheese pizza was cut into 8 equal pieces and the pepperoni pizza was cut into 6 equal pieces. Hana ate 3 slices of the cheese pizza and 1 slice of the pepperoni pizza. What fraction of the two pizzas did Hana eat?

(a) $\frac{3}{8}$ (b) $\frac{1}{6}$ (c) $\frac{1}{3}$ (d) $\frac{13}{24}$ (e) $\frac{1}{12}$

Answer: (d)

43.   If the area of a square is 25 cm^2, what is the perimeter of the square?

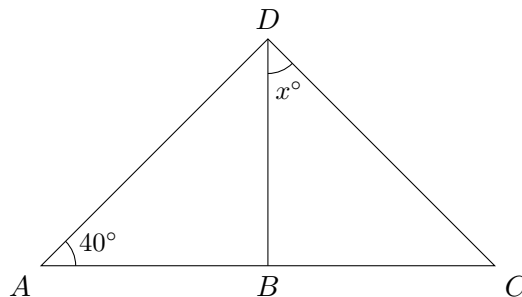(a) 5 cm   (b) 10 cm   (c) 15 cm   (d) 20 cm   (e) 25 cm

Answer: (d)

44.   Which of the following angles could be the smallest in an isosceles right triangle?

(a) 15°   (b) 30°   (c) 45°   (d) 60°   (e) 75°

Answer: (c)

45.   Both angle ADC and ABD are 90 degrees, and the angle DAB is 40 degrees. What is the angle BDC? (*Figure not drawn to scale!*)

(a) 40 degrees   (b) 45 degrees   (c) 50 degrees   (d) 55 degrees   (e) 60 degrees

Answer: (a)

46. A hexagon can be evenly divided into six triangles. If the area of the hexagon is $\frac{2}{3}$, which of the following statements is correct?

(a) The area of each triangle is $\frac{1}{6}$.   (b) The area of two triangles is $\frac{1}{3}$.

(c) The area of half hexagon is $\frac{1}{2}$.   (d) The area of four triangles is $\frac{2}{9}$.

(e) The area of five triangles is $\frac{5}{9}$.

Answer: (e)

47. Which of the following has the largest area?

(a) An equilateral triangle with side of length 1

(b) A square with each side of length 1

(c) A circle with diameter 1

(d) A semi-circle with radius 1

(e) A circle with circumference 1

Answer: (d)

48. Which of the following statements is incorrect?

(a) The area of a circle is greater than 3 times its radius squared.

(b) The circumference of a circle is longer than six times its radius.

(c) The area of a circle with diameter 1 is greater than the area of square with side 1.

(d) The radius of a circle with area 1 is longer than the side length of a square with perimeter 1.

(e) The circumference of a circle with radius 1 is greater than the perimeter of a square with side 1.

Answer: (c)

49. Which of the following statements is incorrect about triangles?

(a) Each triangle has three sides.

(b) Equilateral triangles can have a 90 degree angle.

(c) Equilateral triangles are always isosceles triangles.

(d) The sum of the angles in two triangles is 360 degrees.

(e) The greatest angle in any right triangle is 90 degrees.

Answer: (b)

50. A typical tennis ball can is in the shape of a right circular cylinder, containing three tennis balls. If each cylindrical can is exactly three balls high and one ball wide, which of the following statements is correct about the height and the circumference of the can? (We ignore the thickness of the can.)

(a) The height of the can is six times of the diameter of tennis balls.

(b) The circumference of the can is twice of the diameter of tennis balls.

(c) The height of the can is longer than its circumference.

(d) The circumference of the can is longer than its height.

(e) The height and the circumference of the can are the same.

Answer: (d)

51. Given the pattern
$$1, \ \frac{9}{5}, \ \frac{11}{3}, \ 13, \ -15, \ -\frac{17}{3}, \ x$$
what is x?

Answer: $-\dfrac{19}{5}$

52. Palindrome is a word that reads the same forward or backward, e.g. aabbaa. How many different palindromes of length 6 can we make, using three letters a, b, and c, when repetition is allowed?

Answer: 27

53. At 1:20, what is the smaller angle in degrees between the hour hand and the minute hand in a clock?

Answer: 80 degrees