

Reviewer for Science High School Entrance Test
SUBJECT: Quantitative Analysis (Mathematics)

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INSTRUCTION: Read each question carefully and choose the best answer by shading the letter of your choice in the attached answer sheet. You are given 60 minutes to answer all questions in this test.

1. The average mass of a cat and a rooster is 3.5 kg. The cat is 1 kg heavier than the chicken. Find the mass of the cat.

- A. 0.3 kg
- B. 0.4 kg
- C. 3 kg
- D. 4 kg
- E. 7 kg

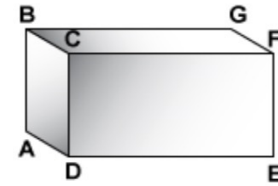
2. How many digits are there before the 25th '4' of the following number pattern?

40400400040000400000...

- A. 132
- B. 324
- C. 342
- D. 431
- E. 1,234

3. Find the surface area of the cuboid below if AD measures 2 inches, DE measures 7 inches, and EF measures 4 inches.

- A. 124 in^2
- B. 68 in^2
- C. 50 in^2
- D. 56 in^2
- E. 100 in^2



4. There were 210 guests at a party. $\frac{2}{5}$ of the adults and $\frac{1}{3}$ of the kids were wearing sneakers. If 78 people at the party were wearing sneakers, how many adults were there in total?

- A. 90
- B. 100
- C. 110
- D. 120
- E. 130

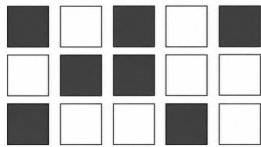
5. Two cars, X and Y, start from the same place at the same time and travel north. Car X travels at 70 km/h while Car Y travels at 110 km/h. How far apart are they after 45 minutes?

- A. 20
- B. 25
- C. 30
- D. 40
- E. 60

6. What is the sum of all prime numbers between 4 and 30?

- A. 129
- B. 124
- C. 105
- D. 100
- E. 95

7. Study the image below. If a black tile represents -2 and a white tile represents $+1$, what is the total value of all the blocks below?



- A. -8
- B. -6
- C. 2
- D. 4
- E. 6

8. Find the smallest whole number between 1 and 100 that is divisible by 4 and by 15.

- A. 60
- B. 30
- C. 24
- D. 15
- E. 12

9. Jack and Jill went hiking. They started to climb at 5:34 AM and reached the summit on the same day at 1:15 PM. How long did they hike?

- A. 3 hours and 56 minutes
- B. 4 hours and 19 minutes
- C. 5 hours and 19 minutes
- D. 6 hours and 32 minutes
- E. 7 hours and 41 minutes

10. In a spelling bee competition, one-third of the participants received gold, silver, and bronze medals in the ratio of 1:2:5, respectively. If there are 144 participants, how many gold medalists are there?

- A. 18
- B. 12
- C. 6
- D. 10
- E. 8

11. The sum of 3 consecutive integers is 78. What is the sum of the smallest and largest integer?

- A. 42
- B. 48
- C. 50
- D. 52
- E. 54

12. Which of the following is less than 55%?

- A. $\frac{7}{13}$
- B. $\frac{5}{9}$
- C. $\frac{11}{20}$
- D. $\frac{3}{5}$
- E. $\frac{2}{3}$

13. The volume of a rectangular solid can be computed by finding the product of its length (l), width (w), and height (h). What happens to the volume of a box if each l, w, and h is halved?

- A. The volume becomes one-half of the original
- B. The volume becomes one-fourth of the original
- C. The volume becomes one-eighth of the original
- D. The volume stays the same
- E. The volume becomes twice the original

14. The sum of two positive numbers is 4, and the sum of their cubes is 28. What is the product of the two numbers?

- A. 2
- B. 3
- C. 4
- D. 5
- E. 6

15. Which of the following exponential expressions has the greatest value?

- A. 2^{40}
- B. 3^{30}
- C. 4^{20}
- D. 5^{10}
- E. 1^{100}

16. The price of a sack of rice was increased by 20% after an economic crisis. After 2 months, when the economy started stabilizing, the new price was then decreased by 20%. What is the overall percent change?

- A. 2% decrease
- B. 2% increase
- C. 4% decrease
- D. 4% increase
- E. 0% change

17. A rectangular prism has dimensions 3 cm, 4 cm, and 12 cm. What is the length of the longest diagonal?

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

18. A frame has dimensions 6.5 in by 10 in. If a square picture that measures 5.25 inches on each side is to be mounted on it, what is the area of the part of the frame that remains as a border in square inches?

- A. 27.56 in^2
- B. 37.44 in^2
- C. 51.38 in^2
- D. 65 in^2
- E. 105.25 in^2

19. Which of the following is an irrational number?

- A. All decimals are irrational numbers
- B. A repeating terminating decimal
- C. A repeating non-terminating decimal
- D. A non-repeating terminating decimal
- E. A non-repeating non-terminating decimal

20. If 30% of p is q , and 20% of q is 12, what is 50% of $p+9$?

- A. 95
- B. 100
- C. 104.5
- D. 109.5
- E. 120

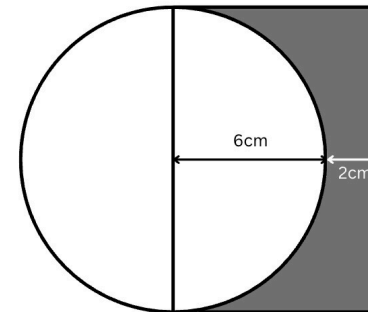
21. If $2^x = 32$, what is the value of x ?

- A. 8
- B. 5
- C. 4
- D. 3
- E. 2

22. If set $A = \{ 1, 2, 3, 4, 5 \}$, which of the following is a subset of A ?

- A. $J = \{ 0, 1 \}$
- B. $K = \{ 2, 4, 6 \}$
- C. $L = \{ 1, 1.25, 1.5, 1.75, 2 \}$
- D. $M = \{ \}$
- E. $N = \{ -1, -2, -3, -4, -5 \}$

23. Study the figure below and find the area of the shaded part.



- A. 39.5 cm^2
- B. 56.5 cm^2
- C. 96 cm^2
- D. 113 cm^2
- E. 143.5 cm^2

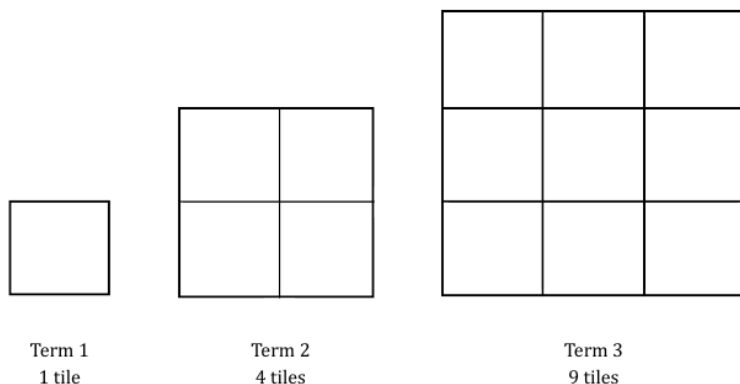
24. In a bus, adults paid \$10.50, while children paid \$7.25. If 30 passengers paid a total of \$285.75, how many children were on it?

- A. 8
- B. 9
- C. 10
- D. 11
- E. 12

25. The product of seven and four less than x is twenty-eight. What is the value of x ?

- A. 12
- B. 10
- C. 8
- D. $\frac{1}{4}$
- E. $\frac{1}{8}$

26. A growing tile pattern is shown below. How many tiles are in the n th figure?



- A. $n + 2$
- B. $2n - 1$
- C. $n(n+1)$
- D. $(n/2)^2$
- E. n^2

27. What is the remainder of 7,700,000,000,202 divided by 9?

- A. 0
- B. 1
- C. 2
- D. 3
- E. 4

28. What time will it be 70 hours after 12:30 p.m. on Monday?

- A. 10:30 a.m. on Thursday
- B. 10:30 p.m. on Thursday
- C. 12:30 p.m. on Wednesday
- D. 10:30 p.m. on Wednesday
- E. 12:30 a.m. on Thursday

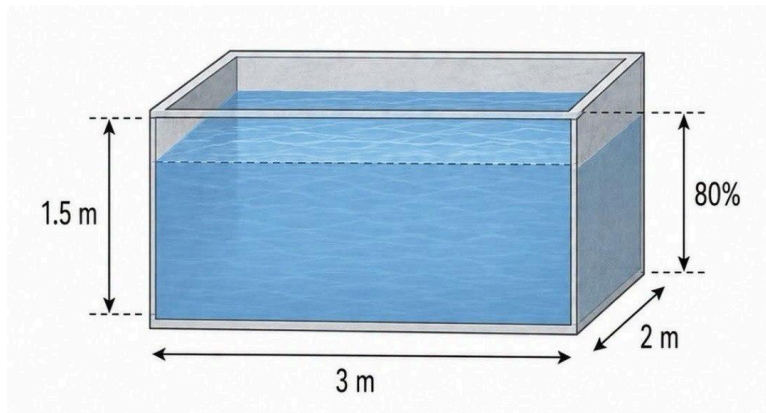
29. What is 174_8 expressed in base 5?

- A. 445_5
- B. 444_5
- C. 335_5
- D. 334_5
- E. 333_5

30. A piece of land was divided equally among 5 children. If each child received $\frac{1}{5}$ of the land, and one child sold $\frac{2}{3}$ of his share, what fraction of the whole did he sell?

- A. $\frac{1}{3}$
- B. $\frac{2}{5}$
- C. $\frac{3}{10}$
- D. $\frac{2}{15}$
- E. $\frac{1}{6}$

31. A water tank is 3 meters long, 2 meters wide, and 1.5 meters deep. If it is filled to 80% of its capacity, how much water does it contain?



- A. 5.4 m^3
- B. 7.2 m^3
- C. 7.9 m^3
- D. 8.2 m^3
- E. 9.0 m^3

32. A townhouse owner plans to install a cylindrical water tank that will be shared and used by 4 apartment units. The volume of the tank is $1134\pi \text{ ft}^3$ and its height is 14 ft. How wide should the tank be?

- A. 9 ft
- B. 18 ft
- C. 19 ft
- D. 36 ft
- E. 81 ft

33. Find the value of x if $(17 - 4x) - (49 - 9x) = 3$.

- A. 7
- B. 13.8
- C. 35
- D. 49
- E. 70

34. Simon drives 36 km south, and then 27 km east. How far is he now from his original position?

- A. 25 km
- B. 35 km
- C. 45 km
- D. 55 km
- E. 75 km

35. According to the pattern shown below, what should be the number filled in the blank?

3, -11, 45, -179, _____, -2867, ...

- A. 713
- B. 714
- C. 715
- D. 716
- E. 717

36. If point B is the midpoint of line segment AC, which of the following is always true?

- A. $AB + AC = BC$
- B. $AC + BC = AB$
- C. $AB = 2(AC)$
- D. $AB = BC$
- E. $AB > BC$

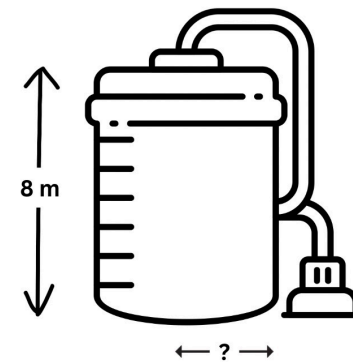
37. If 5 men can fill a tank in 2 hours, how long will it take for 4 men to fill the same tank?

- A. 10 hours
- B. 3 hours
- C. 2.5 hours
- D. 1.6 hours
- E. 1.5 hours

38. If n is a counting number, which of the following expressions represents an even number?

- A. n^2
- B. $2n$
- C. $2n+1$
- D. $n+2$
- E. $n-1$

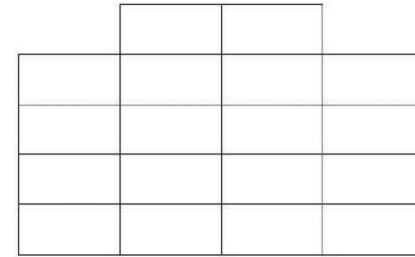
39. A large cylindrical water tank is used to store water for a barangay. The tank can hold 1256 m^3 of water. The height of the tank is 8 meters. What is the radius of the tank?



- A. 7 m
- B. 7.07 m
- C. 8.5 m
- D. 14 m
- E. 50 m

40. Find the sum of all the positive factors of 128.

- A. 45
- B. 125
- C. 200
- D. 255
- E. 280



41. The sum of five consecutive even numbers is less than 180.
What is the greatest possible value of the biggest integer?

- A. 34
- B. 36
- C. 38
- D. 40
- E. 42

- A. 90
- B. 100
- C. 105
- D. 115
- E. 125

42. The age of Gerald is $\frac{1}{3}$ his father's age and $\frac{1}{5}$ of his grandfather's. If the sum of their ages is 144, how old is Gerald?

- A. 16
- B. 18
- C. 15
- D. 14
- E. 20

- A. $3n + 2$
- B. $3(n + 2)$
- C. $n + 6$
- D. $2n + 3$
- E. $3 + n + 2$

44. Which of the following represents the mathematical phrase
“three times the sum of a number and 2”?

45. Which of the following decimals is the smallest?

- A. 0.1
- B. 0.09
- C. 0.0901
- D. 0.099
- E. 0.190

43. How many rectangles are in the figure below?

46. An open wooden box has external dimensions of 4 cm long, 2.5 cm wide, and 2.5 cm high. It is made of wood that is 0.75 cm thick. What is the volume of the wood used in making the box?

- A. 20.625 cm^3
- B. 22.75 cm^3
- C. 24.58 cm^3
- D. 25 cm^3
- E. 26.025 cm^3

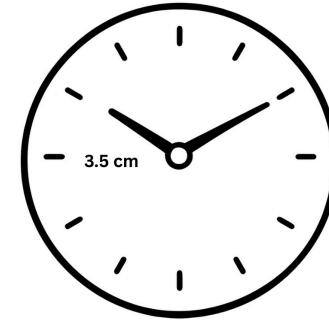
47. Given a and b are positive real numbers and satisfy the equations $a^2 - b^2 = 102$ and $a + b = 6$, find the value of $a + b$.

- A. 13
- B. 15
- C. 17
- D. 19
- E. 21

48. A right cylinder has a radius of 7 cm and a height of $\frac{2}{11}$ cm. Describe what happens to its volume if the radius is halved and the height remains the same.

- A. The volume remains the same.
- B. The volume is increased by 25% from the original.
- C. The volume is increased by 50% from the original.
- D. The volume is reduced to 50% of the original.
- E. The volume is reduced to 25% of the original.

49. Given that the hour hand of a clock is 3.5 cm long. In 24 hours, how far does the tip of the hour hand travel? Use $\pi = \frac{22}{7}$.



- A. 22 cm
- B. 24 cm
- C. 40 cm
- D. 44 cm
- E. 48 cm

50. If $3^1 = 3$, $3^2 = 9$, $3^3 = 27$, and so on, what is the last digit of 3^{99} ?

- A. 0
- B. 1
- C. 3
- D. 7
- E. 9

— END OF PRACTICE TEST —

ANSWER KEY:

- | | |
|-------|-------|
| 1. D | 26. E |
| 2. B | 27. C |
| 3. E | 28. A |
| 4. D | 29. B |
| 5. C | 30. D |
| 6. B | 31. B |
| 7. B | 32. B |
| 8. A | 33. A |
| 9. E | 34. C |
| 10. C | 35. E |
| 11. D | 36. D |
| 12. A | 37. C |
| 13. C | 38. B |
| 14. B | 39. B |
| 15. B | 40. D |
| 16. C | 41. C |
| 17. A | 42. A |
| 18. B | 43. D |
| 19. E | 44. B |
| 20. C | 45. B |
| 21. B | 46. A |
| 22. D | 47. C |
| 23. A | 48. E |
| 24. B | 49. D |
| 25. C | 50. D |