

Middle School Division

Algebra & Probability, Section 2

40 minutes, 25 questions

Instructions

- DO NOT open the test until told to do so.
- Be sure to use your scratch paper!
- Express all of your answers in simplified form.
- Do not include any units.
- Please read the instructions

Please write your name :

Please write your ID number :

Instructions : This is Section 2, algebra and probability. Do all of the questions to the best of your ability. Questions 1 - 15 are multiple choice. Questions 16 - 25 are free response.

Bubble in the multiple choice answers onto the green Scantron. Write the answers to the free response on the answer sheet.

IF we cannot read your answers, it will be marked wrong.

Multiple Choice

1. A can of soda costs \$2, while a box of milk costs \$3. Henry is planning to buy 400 cans of soda and 200 boxes of milk. How much money does Henry need?

- (A) \$1200 (B) \$1400 (C) \$1500 (D) \$1600 (E) \$1900

2. Ella is tearing a random page off her brand new 12-month calendar. What is the possibility of that page being in March?

- (A) $1/9$ (B) $1/10$ (C) $1/12$ (D) $1/13$ (E) $1/14$

3. John sees 20 breadsticks at the supermarket. He can only eat 35% of the breadsticks. How many breadsticks can John eat?

- (A) 5 (B) 6 (C) 7 (D) 8 (E) 11

4. The closest grocery store is 20 miles away. If you are driving at a constant speed of 40 miles per hour, how long, in minutes, does it take to reach the grocery store?

- (A) 25 minutes (B) 28 minutes (C) 40 minutes (D) 15 minutes (E) 30 minutes

5. A car travels at a speed of 60 miles per hour. How far can it travel in 120 minutes?

- (A) 10 miles (B) 30 miles (C) 40 miles (D) 42.5 miles (E) 120 miles

6. A bag contains 4 red marbles, 3 blue marbles, and 5 green marbles. What is the probability of randomly selecting a blue marble from the bag?

- (A) $1/4$ (B) $1/6$ (C) $1/3$ (D) $1/12$ (E) $1/2$

7. If we toss a coin eight times, what is the probability that we get exactly one head?

- (A) $1/128$ (B) $1/64$ (C) $1/32$ (D) $1/16$ (E) $1/8$

8. If we toss a coin two times, what is the probability that we get at least one head?

- (A) $1/4$ (B) $1/2$ (C) $1/3$ (D) $3/4$ (E) $1/6$

9. King Castrolus has gone hunting with four of his servants. If King Castrolus and each of his servants are able to hunt 4.75 and 2.25 deer per hour, respectively, how many deer can they hunt in 4 hours?

- (A) 60 (B) 55 (C) 50 (D) 45 (E) 40

10. There are 4 green marbles and 2 blue marbles in a bag. What is the possibility of picking a green marble and then a blue marble and then another green marble?

- (A) $\frac{1}{6}$ (B) $\frac{1}{4}$ (C) $\frac{1}{3}$ (D) $\frac{1}{2}$ (E) $\frac{1}{5}$

11. If Jane has 20 dollars more than twice the amount of John's money, how much money does Jane have if John has x dollars after paying Alex 40 dollars?

- (A) $2x + 20$ (B) $2x - 20$ (C) $3x - 30$ (D) $x - 15$ (E) $4x + 40$

12. 3 crates of apples weigh 45 kilograms. A crate of pears is 15 kilograms heavier than a crate of apples. How heavy are 15 crates of pears?

- (A) 350 (B) 550 (C) 450 (D) 400 (E) 500

13. Three fourths of a pitcher is filled with pineapple juice. The pitcher is emptied by pouring an equal amount of juice into each of 5 cups. What percent of the total capacity of the pitcher did each cup receive?

- (A) 10% (B) 20% (C) 15% (D) 25% (E) 30%

14. Leo, Emily, George, Alexandra, and William have just received their math exam results back. However, William accidentally spilled his hot chocolate on his paper, blurring his score. It is known that the scores of Leo, Emily, George, and Alexandra are 80, 90, 75, and 100, respectively. If the average score of the 5 students is 78, what did William get in the exam?

- (A) 35 (B) 40 (C) 45 (D) 50 (E) 55

15. A truck driver has been hired to transport 250 crates of porcelain vases. The truck driver will be paid \$20 for each crate that is delivered safely. However, for each broken crate, the truck driver would not only receive no pay at all but have to compensate \$100. If the truck driver received \$4400 in the end, how many crates are broken?

- (A) 6 (B) 8 (C) 1 (D) 20 (E) 3

16. Consider the equation : $\frac{3x}{9} + 4 = 2x + 2$. What is the value of x ?

17. Let's have a break and do a simple number game! Pick any integer as you like!

- Multiply it by 2, add 17 to it, subtract 24 from it, add 9 to it, multiply it by 30

- Subtract 30 from it, divide it by 30, subtract 1 from it, and finally, divide it by 2

What is the difference between this number and the number you picked?

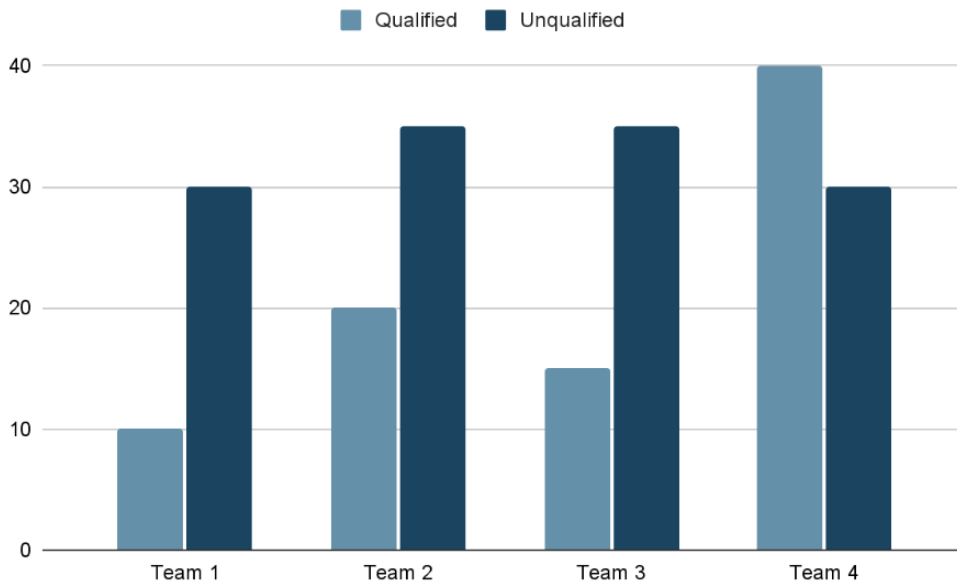
18. Two warehouses have been assigned to store grains. It is given that the maximum storage capacity of warehouse B is 267 tons. If warehouse A's maximum storage capacity is 49 tons greater than triple the maximum storage capacity of warehouse B, what is the maximum storage capacity of warehouse A in tonnes?

19. Rewrite the algebraic expression : $x = \frac{y-b}{m}$ in terms of y.

20. Lumberman Jack takes 9 minutes to cut a log into 4 pieces. Assuming that his speed is constant, how long does it take for him to cut a log of the same length into 36 pieces in minutes?

21. A cup of milk weighs 1600 grams when it is fully filled. If it weighs 900 grams after half of the milk is drunk, how heavy is the cup in grams?

22. The bar chart below illustrates the result of a math tournament. What is the possibility of picking a random participant from Team Four who is qualified for the second stage of the tournament?



23. Sophia rode a bicycle from Santo Francisca to Casteroa Valley in the morning at a speed of 12 km/h. She arrived 5 hours after the start of her journey. However, she had to ride against the wind as she was returning to her home, taking 3 hours longer than her journey in the morning. What was her speed when she was driving back, assuming that it remained constant throughout the journey? Express your answer in km/h.

24. There is a certain amount of red, white, and blue marbles. The sum of the red and white marbles is 62. The sum of the white and blue marbles is 94. Finally, the sum of blue and red marbles is 34. How many white marbles are there?

25. Two paper strips with lengths of 172 and 419 cm are attached onto each other. If the length of the new paper stripe is 343 cm, what is the length of the overlapping part in meters?