

# Mission Math Utah Winter Competition (3-5)

You will have 40 minutes to complete as much of this test as you can. There are 20 free response questions total, and questions are arranged roughly from easiest to most difficult. Units are not needed. Write answers on the given line below each question. Calculators are not allowed. Do not begin the test until told to do so. Good Luck!

Full Name: \_\_\_\_\_

Grade: \_\_\_\_\_

Age: \_\_\_\_\_

1. Evaluate  $1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4}$ .

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2. What is the sum of the first 5 odd positive integers?

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3. Half a pound of candy costs \$3.30. How much does a whole pound of candy cost?

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4. John has 3 piles of sticks. The first pile has 3 sticks that are each 4 inches long. The second pile has 5 sticks that are each 1 inch long. The third pile has 4 sticks that are each 2 inches long. If John takes all his sticks and lays them out end-to-end, how long will the sticks be in total?

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5. Mingchuan has \$150 in cash. If he only has twenty dollar bills and five dollar bills and he has an equal number of each bill, how many total bills does he have?

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6. A contestant on a game show does not know the answer to a multiple-choice question with 4 answer choices, so he asks the audience for help. 23.2% vote for option A, 35.7% vote for option B, and 12.1% vote for option C. What percent of the audience voted for option D? (Express your answer as a whole number.)

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7. At the local marketplace, an energy drink costs \$1.50. Aidan walks into the store with \$20.00, with hopes of buying as many drinks as possible. Disregarding tax, how many drinks can Aidan buy?

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8. Justin has an unknown number of cookies. If he were to divide his cookies evenly among his 5 friends (giving each friend a positive integer number of cookies), he will have 4 cookies left. What is the smallest possible number of cookies Justin could have?

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9. What is the largest 5-digit palindrome divisible by 5?

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10. Joe plays golf every 3 days and Donald plays golf every 5 days. If they play on the same day today, how many times will they play on the same day again within the next 50 days?

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11. An isosceles triangle has a side of length 4 and a side of length 10. What is the area of the triangle?

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12. A woodchuck chucks wood at a rate of 20kg of wood per hour. Another woodchuck chucks wood at a rate of 25kg of wood per hour. The two woodchucks have just found a tree that weighs 900kg. Working together, how many hours will it take for the woodchucks to chuck the whole tree?

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13. There are 24 permutations of the letters in the word BLUE. For how many of them is the letter E not the last letter?

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14. An airplane can fly from Los Angeles to New York, a 2800 mile journey, in 10 hours with a constant headwind – wind slowing down the plane. The return journey with the same wind only takes 7 hours, this time aiding the plane. How fast, in miles per hour, can the airplane fly in still air?

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15. A rectangle has a diagonal of length 12 and a perimeter of 32. What is the area of this rectangle?

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16. A customer paid \$72.76 at the register for a textbook. The textbook was on sale for 20% off, and there was a 7% sales tax applied to the purchase. What was the original price of the textbook?

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17. In the Martian economy, 7 freckles are worth the same as 3 farkles and 8 farkles are worth the same as 3 furbles. If one US dollar converts to 5 freckles, how many \$2.00 apples can a martian buy with 4 furbles?

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18. Two fair dice are rolled. What is the probability that their sum is greater than 4? (Answer in fractions)

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19. Luke and Zach are traveling from a hotel to the airport. Luke decides to wait for the bus at the hotel, while Zach decides to run. After Zach leaves, Luke waits for 9 minutes before the bus arrives, and he reaches the airport in 4 minutes. Two minutes later, Zach arrives at the airport. If the distance from the hotel to the airport is 2 miles, how fast does Zach run (in miles per hour)?

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20. A cylinder has diameter of 12 and a height of 16. What is the radius of the smallest sphere that contains this cylinder?

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