Mission Math Spring Competition 2025 3-5 Exam

You will have 40 minutes to complete as much of this test as you can. There are 30 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. Andrew makes \$15 an hour. If he works 12 hours, how much money will he make?

_____

2. Gus has \$1600. If he gives half of his money to Kevin and a fourth of the remaining money to Symon how much money does he have left?

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3. A bag of coins contains 5 pennies, 8 nickels, and 3 dimes. Bill picks 1 coin at random. What is the probability that the coin is not a penny? Express your answer as a common fraction.

_____

4. What is the area of a square with side length 6?

_____

5. How many prime numbers are there between 10 and 20?

_____

6. What is the median of the numbers $15, 18, 16, 12, 15, 25, 3$?

_____

7. Kimchi costs \$8 per jar. Hailey has \$115. How many jars of kimchi can Hailey buy?

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8. How many factors does 18 have?

_____

9. A farmer has chickens and cows on his farm. All animals have 1 head. Chickens have 2 legs, and cows have 4 legs. There are 28 heads and 80 legs in total on the farm. How many cows are there?

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10. What is $20^2 - 19^2$?

_____

11. What is the perimeter of a right triangle with legs of length 5 and 12

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12. Ellie rolls 2 standard die and multiplies the 2 numbers she gets. What is the probability that the number she obtains is even? Express your answer as a common fraction.

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13. How many ways can you arrange 3 identical red marbles and 2 identical blue marbles in a line?

_____

14. Lebron scores 15 points in the first quarter, 12 points in the second quarter, 9 in the third quarter, and X points in the fourth quarter. If his average number of points per quarter is 12 points, what is X?

_____

15. In quadrilateral $MATH$, $\angle M = 135°$, $\angle A = 60°$, $\angle T = 80°$. What is the value of $\angle H$?

_____

16. How many divisors of the number 360 are even?

_____

17. What is the sum of all multiples of 5 between 10 and 100, inclusive?

_____

18. Ryan and Olivia are planning to meet up. Ryan rides his bike at 10 mph and Olivia walks at 2 mph. If their houses are 8 miles apart, how many minutes does it take for them to meet up?

_____

19. Nathan has a red shirt, a blue shirt, and a green shirt. He also has red pants, blue pants, and green pants. He wants to wear one shirt and one pair of pants, but he doesn't want his shirt and pants to be the same color. How many possible outfits can he make?

_____

20. What is the sum of the roots in the quadratic $6x^2 - 6x + 120$?

_____

21. James is standing in the corner of a rectangular field with side lengths of 12 feet and 16 feet. He wants to get to the opposite corner from where he is at now. How many less feet does he walk if he cuts across the field in a straight line compared to if he walked around the edge of the field?

_____

22. What is $\frac{7! \cdot 8!}{6! \cdot 9!}$

_____

23. Johnathan has 8 pieces of candy to distribute among 3 people. How many ways can he distribute the candy if not everyone must receive candy?

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24. On planet Zab they have 3 forms of currency, Zebs, Zibs, and Zobs. 14 Zebs are equal to 9 Zibs, and 15 Zibs are equal to 17 Zobs. How many Zobs are equivalent to 42 Zebs? Express your answer as a common fraction.

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25. A square is inscribed in a circle of radius 20. What is the area of the circle that is not in the square? Express your answers in terms of π.

26. There is a 30% chance it rains on Monday, a 60% chance it rains on Tuesday, and a 20% chance it rains on Wednesday. What is the probability it rains on at least 1 of these days? Express your answer as a common fraction.

27. The roots of the cubic $2x^3 - 18x^2 + 5x - 40$ are a, b, and c. What is the value of $a^2 + b^2 + c^2$?

28. $ABCD$ is a cyclic quadrilateral with diagonals AC and BD intersecting at E. $\overset{\frown}{AD} = 80^\circ$ and $\overset{\frown}{BC} = 120^\circ$. What is the value of $\angle AED$

29. What is the units digit of $7^{102} \cdot 6^{100}$?

30. H_n is the number of dots in n concentric hexagons. The hexagonal numbers are defined as written below. If H_j is a perfect square, find the smallest possible value of j such that $j > 1$.