Note: "e. None of these" is a choice for every question, if the answer is not given or there is a problem with the question.

1. Matt flipped two fairs coins together. He continued doing so until at least one of the coins turns up heads. What is the probability that both are heads on the last flip?

a. 1/6	b. 1/4	c. 1/3	d. 1/2

2. Simplify: $\frac{2\sqrt{5}-\sqrt{3}}{\sqrt{5}+2\sqrt{3}}$

a. $\frac{-16+5\sqrt{15}}{7}$	b. $\frac{16-5\sqrt{5}}{7}$	c $\frac{16\sqrt{5}-5}{7}$	d. $\frac{-16\sqrt{15}-5}{7}$

3. Aaron and Cavan are piloting two planes. Aaron's plane has a speed that is 75 miles per hour faster than Cavan's plane. They each fly the same distance, but Aaron flies for 3 hours while Cavan flies for 3 hours and 36 minutes. How far do they each fly?

a. 375 miles	b. 450 miles	c. 1000 miles	d. 1350 miles

4. Solve for x: $\sqrt{2x+9}=5$

a. 0	b. 9	c. 8	d. 14

5. On *Dancing with the Stars*, 10 couples (including James and Janice) were competing. Each participant hugged everyone else, except his or her own partner. How many hugs were there?

a. 45	b. 100	c. 180	d. 190

6. The average of three positive integers is 5. The sum of the reciprocals of the three numbers is 17/24. The product of the three numbers is 96. What is the median of the three numbers?

a. 3	b. 4	c. 5	d. 6

7. Twice Andy's age minus Madi's age is equal to 9. Twice Madi's age minus 8 equals twice Andy's age. What is the positive difference of their ages?

a. 8 years	b. 5 years	c. 4 years	d. 2 years

8. Sean's Bikes has the same number of bicycles as tricycles in stock, but they have 54 more wheels than seats. What is the total number of bicycles and tricycles in the shop?

a. 18	b. 36	c. 54	d. 81

9. The math team wants to buy new team t-shirts. Graphics by Andrew charges a $50 set-up fee and $8 per shirt. Team Andres charges a $40 set-up fee and $10 per shirt. How many shirts have to be ordered to make the costs the same from each company?

a. 10	b. 12	c. 8	d. 5

10. Taylor made up a tournament test. Taylor's test consists of true/false questions and fill-in-the-blank questions. There are 24 questions on the test. If the true/false questions are worth three points each and the fill-in-the-blank questions are worth seven points each for a total of 100 points, how many of the questions are fill-in-the blank questions?

a. 10 questions	b. 7 questions	c. 5 questions	d. 12 questions

11. Hannah is mixing two types of Easter candy. The chocolates cost $5 a pound, and the caramels cost $4 a pound. If she creates 8 pounds worth $4.25 a pound, how much of the chocolate did she use?

a. 6 pounds	b. 3 pounds	c. 2 pounds	d. ¾ pounds

12. Erin has a bag of ping-pong balls numbered 1 – 15. She draws out two without replacement. What is the probability that the two she draws out have consecutive numbers?

a. $^{11}/_{105}$	b. $^{2}/_{15}$	c. $^{7}/_{15}$	d. $^{22}/_{105}$

13. If $\log_2 8 = 3$ and $\log_2 16 = 4$, then find $\log_6 216$.

a. 1	b. 2	c. 3	d. 4

14. The height of a paintball fired from Josh's gun can be described by $h = -16t^2 + 60t$ where t is the time in seconds and h is the height in feet. How long will it take for the paintball to first reach 36 feet?

a. 0.75 sec	b. 1 sec	c. 1.5 sec	d. 3 sec

15. Find the sum of the reciprocals of the roots of $3x^2 - 4x - 7 = 0$.

a. $^{4}/_{7}$	b. $^{4}/_{3}$	c. $^{10}/_{3}$	d. $^{10}/_{7}$

16. Melissa makes $6.50 an hour as a lifeguard and $7.50 an hour as a cashier during the summer. In one week she works for 19 hours and makes $132.50. How many hours did she work as a cashier?

a. 10 hours	b. 12 hours	c. 9 hours	d. 7.5 hours

17. How many regular polygons with fewer than 100 sides have internal angle measures whose values are integer degrees?

a. 15	b. 16	c. 18	d. 20

18. A line segment has endpoints at (-4,5) and (6,3). What is the equation of the line with slope $^2/_3$ that passes though its midpoint?

a. $y = {}^2/_3x + 10$	b. $3y = -2x + 20$	c. $y = {}^3/_2x - 19$	d. $2x - 3y = -10$

19. What is the remainder when $x^{100} + x^{98} + x^{96} + \ldots + x^4 + x^2 + 1$ is divided by $x - 1$?

a. 50	b. 51	c. 101	d. 100

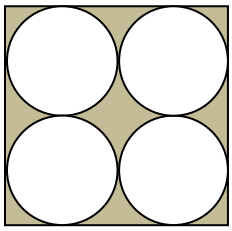
20. A rectangular prism has edges of 2, 3, and 4 cm. If each edge is increased by 50%, by what factor is the volume increased?

a. 225%	b. 337.5%	c. 150%	d. 50%

21. Which quadrant contains the vertex of the following: $f(x) = 2x^2 - 8x + 11$?

a. I	b. II	c. III	d. IV

22. What is the area of the shaded portion of the figure if the circles are congruent and tangent to each other and the square, and the side length of the square is 12 inches?



a. $144 - 36\pi$	b. $144 - 144\pi$	c. $144 + 36\pi$	d. $144 - 9\pi$

23. The sides of a rectangle are represented by 2x and 5x. If the perimeter of the rectangle is 70 inches, what is its diagonal length, in simplest form?

a. $5\sqrt{29}$ in	b. $\sqrt{725}$ in	c. $29\sqrt{5}$ in	d. $25\sqrt{29}$ in

24. Which parabola below would have the narrowest graph?

a. $y = 7x^2 + 45x$	b. $y = 0.7x^2 + 45x$	c. $y = 45x^2 + 7x$	d. $y = x^2 + 7x$

25. If $x + \frac{1}{x} = 4$, what is $x^3 + \frac{1}{x^3}$?

a. 64	b. 60	c. 56	d. 52

Tiebreakers

1. If it takes 3 students 6 hours to install 2 light bulbs, how long will it take 9 students to install 5 light bulbs?

2. Sally sells sea shells down by the sea shore. How many seashells could she sell in April if 1 out of every 16 people who pass by buy 2 sea shells, and 3456 people walk by her place every day?

3. $2010_3 + 2010_6 = \_\_\_\_\_{}_9$