



Individual Test 7th/8th

1	An absent-minded professor is on his way to work. The probability that he forgets his glasses is $\frac{1}{3}$. The probability that he forgets his keys is $\frac{1}{5}$. What is the probability that he remembers to bring both his glasses and his keys?
2	If 125% of a number is 425, what is 75% of the number?
3	Define $a^{\circ}b$ by $a^{\circ}b = ab(b - a)$. What is the value of $2^{\circ}5$?
4	A picket fence is built with posts that are 4 inches wide and spaced 5 inches apart. If there are 5 posts in the gate, how many inches wide is the gate?
5	The area of regular hexagon <i>SKYRIM</i> is 30. What is the area of the triangle <i>KRM</i> ?
6	If I flip a fair coin 5 times, what is the probability that I obtain at least 3 heads?
7	What is the maximum number of regions into which 3 planes can divide 3-D space?
8	What is the circumference of a circle with a diameter of 6 feet?
9	Penelope, who is 5 feet tall, notices that her shadow is 4 feet long. A nearby flagpole casts a shadow 24 feet long. How many feet tall is the flagpole?
10	How many space diagonals (diagonals not passing through faces or edges) are in a cube?
11	What is the units digit of the sum $2011^{2011} + 2012^{2012}$?
12	6 farmers can milk 6 cows in 6 days. How long would it take 10 farmers to milk 15 cows?
13	Rose can read 900 words per minute while Austin can read 360 words per minute. In one second, how many more words can Rose read than Austin?
14	Roland's bicycle wheel has a diameter of 27 inches. How many feet does he travel if the wheels on his bike make 200 revolutions?
15	A square with vertices $(0, 0)$, $(0, 4)$, $(4, 4)$, and $(4, 0)$ is rotated 180 degrees clockwise about the origin. What is the sum of the coordinates of the new square's vertices?
16	A goat is tied by a 6 foot long rope to the corner of an equilateral triangular barn with sides 6 feet long. What is the total area, in square feet, that the goat can reach?
17	Delaney wants to buy 3 cookies, each of which is unique from the others (she doesn't want two cookies of the same type). There are 4 types of cookies at the bakery: chocolate chip, oatmeal raisin, peanut butter, and sugar. In how many ways can she buy the cookies?
18	Fred cuts a spherical orange with radius 4 into four equal slices. What is the difference between the final and the original total surface area of the orange?
19	What is the sum of the solutions to $3x^2 + 5x - 2 = 0$?
20	Yesterday I baked 6 batches of cookies. Each batch had 12 cookies. Of the 6 batches of cookies, half of them were gingerbread cookies. In each batch of gingerbread cookies, $\frac{2}{3}$ were decorated. Of the decorated gingerbread cookies, $\frac{1}{4}$ had gumdrop buttons. How many cookies were gingerbread cookies with gumdrop buttons?

21	Andrea has a $2 \times 3 \times 4$ rectangular prism. She paints the entire outside of it green, then cuts it into 24 $1 \times 1 \times 1$ cubes. How many cubes are not painted on any side?
22	Anthony, Brittany, Charles, and Diego decide to race each other. Anthony did not finish first, but finished the race three seconds faster than Diego. If Brittany had finished the race two seconds faster, she would have tied for second place. List the order in which they crossed the finish line, from first to fourth.
23	What is the sum of the next two terms in the following sequence? 3, 6, 12, 24, 48, __, __
24	When the minute hand of an analog clock has travelled 180 degrees, how many degrees has the hour hand travelled?
25	If a and b are positive integers less than 30 and $\frac{a}{b} = \frac{4}{3}$, what is the maximum value of $a + b$?
26	What is the least integer greater than 2012 that has an odd number of factors?
27	What is the sum of the integer factors of 100?
28	Daniel puts 3 cards, one with both sides colored red and two with one side colored red and the other colored blue, in a hat. He randomly draws one and looks at one side. Given that the side he sees is red, what is the probability the other side is also red?
29	What is the sum of all of the solutions to $\frac{4x}{x-1} = \frac{4x}{2x+2}$?
30	A slug is climbing out of a 30-foot well. Each day, he climbs 6 feet. However, during the night he slides down 2 feet. How many days will it take the slug to climb out of the well?
31	Sarah owns a coin on which the probability of flipping heads is $\frac{1}{3}$ and the probability of flipping tails is $\frac{2}{3}$. If Sarah flips the coin twice, what is the probability that she gets one head and one tail?
32	Leila wants to average an A (at least 90%) on her tests this year. So far, she has taken three tests and attained an average score of 87%. What must Leila get on the next test, which is out of 100 points, to achieve her goal?
33	How many ways are there to place 8 rooks on a chessboard such that no two rooks threaten each other? Rooks move along columns and rows, but not diagonals.
34	Triangle ABC is constructed so that the measure of angle B is 45 degrees and the measure of angle C is 30 degrees. If AC has a length of 6, what is the length of BC ?
35	What is the area of a circle defined by the equation $x^2 + y^2 = 81$?
36	Evaluate: $0.1 + 1.\bar{1} + 1.0\bar{1}$. Express your answer as an improper fraction.
37	Express 12200021102_3 in base 9.
38	Ruby and Sierra are playing a game in which they take turns rolling a fair six-sided die. If a prime number is rolled, the girl who rolled it wins. Otherwise, the other girl gets a chance to roll the die. If Ruby goes first, what is the probability that Sierra wins?
39	Dalia buys a pizza with a diameter of 14 inches. If the pizza is divided into eight equal slices and Dalia eats 3 slices, what area of pizza is left over, in square inches?
40	Circle A has a radius of 2 and is centered at $(3, -4)$. Circle B is centered at $(10, 5)$ and passes through the point $(6, 8)$. What is the shortest possible distance between a point on circle A and a point on circle B ?