

ROUND 1

1. TOSSUP: Expressing your answer in the correct unit, what is the **area** of a triangle with a base of 4 cm and a height of 5 cm? (10 cm²) -10 pts
BONUS: A string in the shape of a 4 by 9 rectangle is reshaped into a square.
(a) What is the **perimeter** of the square? (26) -8 pts
(b) What is the **area** of the square? (42.25 or $42\frac{1}{4}$) -12 pts
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2. TOSSUP: How many seconds are in one-half a minute? (30) -10 pts
BONUS: How many seconds are in a 31 day month? (2,678,400) -20 pts
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3. TOSSUP: What is one-half of one-half of 20? (5) -10 pts
BONUS: A sixth grade girl weighs $\frac{5}{6}$ as much as her eighth grade brother who is 20 lbs heavier than she is. How much do they each weigh?
(She weighs 100 lbs, he weighs 120 lbs) -20 pts
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4. TOSSUP: Using the correct unit of measure, find the area of a rectangular lawn that measures 20 feet by 30 feet. (600 square feet) -10 pts
BONUS: If Andre can mow the same 20 foot by 30 foot lawn at the rate of 1 square yard per minute, how long in hours, minutes and seconds will it take him to mow the entire lawn? (1 hour, 6 minutes, 40 seconds) -20 pts
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5. TOSSUP: If the legs of a right triangle are of lengths 3 and 4, find the length of the hypotenuse. (5) -10 pts
BONUS: A square has two diagonals. How many diagonals can be drawn in a hexagon? (9) -20 pts
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6. TOSSUP: What is the probability of selecting a can of peaches from unmarked cans if you have 3 cans of peaches, 2 cans of pears and 2 cans of pineapple? $\left(\frac{3}{7}\right)$ -10 pts
BONUS: (a) How many ways can the letters M, E, D, A, R be arranged without repetition? (120) -10 pts
(b) What is the probability that a random arrangement of these letters will form the word DREAM? $\left(\frac{1}{120}\right)$ -10 pts
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7. TOSSUP: Supply the fourth number in the following proportion:
1 is to 3 as 2 is to **what**? (6) -10 pts
BONUS: On Monday Alex biked 4 miles, on Tuesday he biked 8 miles, on Wednesday he biked 18 miles. Meanwhile, Chris bikes 5 miles on Monday. On Tuesday and Wednesday, the ratio of Chris's biking distance to Alex's is the same as it was on Monday.
(a) How many miles does Chris bike on Tuesday? (10) -10 pts
(b) How many miles does Chris bike on Wednesday? $\left(22.5 \text{ or } 22\frac{1}{2}\right)$ -10 pts
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- TIEBREAKER: Using the correct unit of measure, state the volume of a cube with edge length 3 inches. (27 cubic inches) -10 pts
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ROUND 2

1. TOSSUP: Name one of the prime divisors of 12. (2 or 3) -10 pts

- BONUS: (a) Find the sum of the first eight prime numbers. (77) -10 pts
 (b) It is possible to find a set of three distinct prime numbers whose sum is 23.
 Find two such sets. (3, 7, 13 and 5, 7, 11) -10 pts
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2. TOSSUP: The complement of angle A is 45 degrees. What is the measure of angle A?
 (45 degrees) -10 pts
 BONUS: An isosceles triangle has a base of 24 inches and a height of 5 inches. Give the
 lengths of the two sides. (13 inches each) -20 pts
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3. TOSSUP: What number is 10 times 17? (170) -10 pts
 BONUS: Courtney's math average is 8 points less than Sharon's and Sharon's average is 4
 less than Deeja's.
 (a) What is Deeja's average if Courtney's average is 83? (95) -8 pts
 (b) What is the combined average of the three students? (rounded to the nearest tenth)
 (89.7) -12 pts
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4. TOSSUP: Using the correct unit of measure, what is the radius of a bicycle wheel whose
 diameter is 27 inches? (13.5 inches) -10 pts
 BONUS: Mr. Barnes painted the inside (including the floor) of a cylindrical swimming
 pool that has a diameter of 32 feet and a depth of 8 feet. How many square
 feet of surface did he paint? Round to the nearest 10 square feet.
 (1610 or 1610 square feet) -20 pts
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5. TOSSUP: How many days will the leap year 1996 have? (366) -10 pts
 BONUS: Everyone knows that February normally gets an extra day in years that are divisible
 by 4. Less well known is that in years that are divisible by 100 but not by 400,
 February does **not** get that extra day. Thus there was no February 29 in the year
 1900, but there will be a February 29 in the year 2000. How many days will there
 be in the century from January 1, 1900, to December 31, 1999, inclusive?
 (36,524) -20 pts
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6. TOSSUP: What is the degree measure of each acute angle in an isosceles right triangle?
 (45 degrees) -10 pts
 BONUS: The measure of one acute angle in a right triangle is 54 degrees 35 minutes.
 Find the measure of the other acute angle. (35 degrees 25 minutes) -20 pts
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7. TOSSUP: Find 3% of 100. (3) -10 pts
 BONUS: The membership of the Junior High Chess Club increased from 256 to 288.
 What was the percent of increase? (12.5% or 12.5) -20 pts
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- TIEBREAKER : Find the product "one point two times four."
 (four point eight, or four and eight tenths, or four and four fifths) -10 pts
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ROUND 3

1. TOSSUP: How many elements are contained in the null or empty set?
 (zero or none) -10 pts
 BONUS: There are 15 girls on the volleyball team. There are 20 girls on the basketball team.
 It is **possible** for some of the same girls to be on both teams.
 (a) What is the largest possible number of girls the **intersection** of these two
 teams could have? (15) -10 pts
 (b) What is the largest possible number of girls the **union** of these two teams could
 have? (35) -10 pts
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2. TOSSUP: Express 20% as a fraction in simplest terms. $\left(\frac{1}{5}\right)$ -10 pts
 BONUS: Fran makes fake blood using four drops of red food coloring for every one drop of

yellow food coloring (to make it look brown when it dries).

- (a) How many pints of red food coloring will she need in order to make 16 pints of fake blood? $\left(12.8 \text{ or } 12\frac{4}{5}, \text{ etc.}\right)$ -12 pts
- (b) What percent of the mixture is yellow food coloring? (20%) -8 pts
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3. TOSSUP: There are 3 cards – one marked with letter A, one with letter B and one with letter C. In how many different ways can the cards be arranged with letter A appearing first?

(2) -10 pts

BONUS: How many different whole numbers can be made with the digits 1, 2, 3, 4? Any number you make can have 1 to 4 digits in it. You cannot repeat a digit in any number you make. (64) -20 pts

4. TOSSUP: What improper fraction is equivalent to $3\frac{1}{7}$? $\left(\frac{22}{7}\right)$ -10 pts

BONUS: In an orange juice survey, $\frac{2}{5}$ of the people questioned were under 20 years old. If 144 people were under 20, how many were questioned in the survey? (360) -20 pts

5. TOSSUP: If a triangle has 2 angles that measure 45 degrees each, what is the measure of the third angle? (90 degrees) -10 pts

BONUS: In a parallelogram ABCD, if the measure of angle D is 105 degrees, what is the measure of angle A? (75 degrees) -20 pts

6. TOSSUP: What fraction added to $\frac{5}{8}$ is equal to 1? $\left(\frac{3}{8}\right)$ -10 pts

BONUS: Heather sold $18\frac{1}{3}$ dozen cupcakes at the school sale. Tonya sold $\frac{3}{4}$ as many.

- (a) How many dozen cupcakes did Tonya sell? $\left(13\frac{3}{4} \text{ dozen}\right)$ -12 pts
- (b) How many individual cupcakes is this? (165 cupcakes) -8 pts
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7. TOSSUP: A certain jet traveled at a constant rate of one thousand miles per hour. How far did it travel in 30 minutes? (500 miles) -10 pts

BONUS: The average human heart rate is 70 beats per minute. At this rate, determine the number of times a human heart would beat in one week? (705,600) -20 pts

TIEBREAKER: What is the opposite of the opposite of negative 5? (-5) -10 pts

ROUND 4

1. TOSSUP: Express as a fraction the sum of one-half and one-fourth. $\left(\frac{3}{4}\right)$ -10 pts

BONUS: Write the fraction $\frac{5.2}{9.36}$ in simplest terms. $\left(\frac{5}{9}\right)$ -20 pts

2. TOSSUP: Find the greatest common factor of 12 and 20. (4) -10 pts

BONUS: Suppose 60 stars were arranged on a flag in a rectangular array. One possible arrangement would be a 2 by 30 array. Name all other possible arrangements.

(1 by 60, 3 by 20, 4 by 15, 5 by 12, 6 by 10) –4 pts each

3. TOSSUP: What is the longest side of a right triangle called? (hypotenuse) –10 pts
BONUS: Bill and Barbara went skating at noon. Bill skated north at 3 km per hour and Barbara skated west at 3.5 km per hour. How far apart were they at 2 pm?
Round to the nearest tenth of a km. (9.2 or 9.2 km) –20 pts

4. TOSSUP: What is 10% of \$5.00? (\$0.50 or 50 cents) –10 pts
BONUS: In a recent election, only 3,600 votes were cast. Candidate I.M.Thrifty received 43% of the votes. Candidate Will Spendalot received 37% of the votes. Candidate N.O.Promises received 20% of the votes. A $\frac{2}{3}$ majority is needed to win. How many more votes would each candidate need to win?
(I.M.Thrifty needs **852** more votes,
Will Spendalot needs **1,068** more votes,
N.O.Promises needs **1,680** more votes.) –20 pts

5. TOSSUP: How many cups are there in one quart? (4 cups) –10 pts
BONUS: How many cups are there in 14.5 gallons? (232 cups) –20 pts

6. TOSSUP: What is one third of one third? (one ninth) –10 pts
BONUS: A 3 by 5 photo is enlarged to a 6 by 8 photo. What is the percent increase in area?
(220%) –20 pts

7. TOSSUP: Express as a decimal, 123 divided by 100. (1.23) –10 pts
BONUS: Some number multiplied by 2^4 , then decreased by 3^2 is 199. What is that number?
(13) –20 pts

TIEBREAKER: Find the quotient “two point three divided by one tenth.” (23) –10 pts

ROUND 5

1. TOSSUP: Name the polygon that has two sides fewer than an octagon. (hexagon) –10 pts
BONUS: What is the sum of the measures of the interior angles in a convex pentagon?
(540 degrees) –20 pts

2. TOSSUP: 51% equals what fraction in simplest form? $\left(\frac{51}{100}\right)$ –10 pts
BONUS: (a) 10 is what percent of 4,000? $\left(.25\% \text{ or } \frac{1}{4}\%\right)$ –10 pts
(b) $87\frac{1}{2}\%$ of \$4,000 is what amount? (\$3,500) –10 pts

3. TOSSUP: What is the value of 2^5 ? (32) –10 pts
BONUS: Express these numbers in scientific notation.
(a) Seven hundred twenty–five billion (7.25×10^{11}) –10 pts
(b) Seventy–three ten thousandths (7.3×10^{-3}) –10 pts

4. TOSSUP: What is the product of 1 times 2 times 3 times zero times 9? (zero) –10 pts
BONUS: What is the largest possible product of two numbers, if the sum of the two numbers is thirty-six? (324) –20 pts

5. TOSSUP: Find 30% of 50. (15) –10 pts

BONUS: Huff ate $\frac{2}{3}$ of a container of ice cream. Crunch ate $\frac{3}{5}$ of Huff's leftovers.

Exactly what percent of the original amount is left? $\left(13\frac{1}{3}\%\right)$ -20 pts

6. TOSSUP: If a cube has a side that measures 4 feet, what is its volume in cubic feet?
(64 or 64 cubic feet) -10 pts

BONUS: If a sphere has a radius of 5 meters, what is the volume of the sphere?
(Round to the nearest cubic meter) (523 or 524 cubic meters) -20 pts

7. TOSSUP: What is the reciprocal of $\frac{6}{5}$? $\left(\frac{5}{6}\right)$ -10 pts

BONUS: Jack and Jill want to buy a new crown to replace the one Jack broke the last time up the hill. A new crown will cost \$77.50. Jack and Jill have nothing but quarters. How many quarters will it take to buy the crown? (310) -20 pts

TIEBREAKER: What is the absolute value of negative seventeen? (17) -10 pts

ROUND 6

1. TOSSUP: If a car travels at 30 mph for 2 hours, what is the distance traveled in miles?
(60 miles) -10 pts

BONUS: How long will it take a train 1 mile long traveling at 20 mph to pass completely through a tunnel 1 mile long? $\left(\frac{1}{10}\text{ hour or 6 minutes}\right)$ -20 pts

2. TOSSUP: Using the correct unit of measure, find the area of a square whose perimeter is 40 meters.
(100 square meters) -10 pts

BONUS: A rectangular backyard measures 400 ft by 90 ft. It has a rectangular pool in the center which measures 20 ft by 90 ft. If grass sod pieces measure 12 in by 16 in, how many are needed to cover the remainder of the yard with grass?
(25,650 pieces) -20 pts

3. TOSSUP: What percent decrease is represented by a reduction from \$50 to \$45?
(10%) -10 pts

BONUS: Yesterday, Rich's Department Store had a one-day sale. Gordon paid \$20.40 for a sweater whose list price had been \$34. His sister, Wanda, bought an organizer bag originally priced at \$19.99, but discounted 30%. Find, to the closest whole percent, the percent reduction their combined purchases represented.
(36%) -20 pts

4. TOSSUP: Give the degree measure of the angle between the minute hand and the hour hand of a clock when the time is exactly 6 o'clock. (180 or 180 degrees) -10 pts

BONUS: Give the degree measure of the angle between the minute hand and the hour hand of a clock when the time is exactly:
(a) 2 o'clock. (60 or 60 degrees) -8 pts
(b) 6:30 (15 or 15 degrees) -12 pts

5. TOSSUP: What is the following sum: one to the third power plus one to the fifth power plus one to the seventh power? (3) -10 pts

BONUS: What is the units digit of the number formed by raising three to the one thousand nine hundred ninety-fifth power? (7) -20 pts

6. TOSSUP: Suppose we agree to count the letter Y as a vowel. If we pick a letter at random from the alphabet, what is the probability that it will be a vowel?

$$\left(\frac{6}{26} \text{ or } \frac{3}{13}\right) \quad -10 \text{ pts}$$

BONUS: An ice chest contains 5 cans of Pepsi, 4 of Coke, and 3 of Dr. Pepper. Two cans are pulled out at once without looking. Express the following answers as fractions in lowest terms.

(a) What is the probability that both cans are Cokes? $\left(\frac{1}{11}\right)$ -10 pts

(b) What is the probability that neither can is a Coke? $\left(\frac{14}{33}\right)$ -10 pts

7. TOSSUP: What is $33\frac{1}{3}\%$ of 33? (11) -10 pts

BONUS: On a mathematics test, a group of 20 adults averaged 80%, while a group of 30 teenagers averaged 70%. Expressed as a percent, what was the average for the entire 50-person group? (74%) -20 pts

TIEBREAKER: What is the name for a quadrilateral with exactly two parallel sides? (trapezoid) -10 pts

ROUND 7

1. TOSSUP: If Forrest Gump ate a box of chocolates a day for 3 days at a total cost of \$18, what was the price of one box of chocolates? (\$6.00) -10 pts

BONUS: Sue buys chocolate at 3 bars for \$3.60 while Barb buys chocolate at 4 bars for \$4.50. What is the smallest positive number of bars Sue can buy that will result in her spending exactly the same amount of money as Barb? (15 bars) -20 pts

2. TOSSUP: Convert $\frac{4}{8}$ to a decimal. (.5) -10 pts

BONUS: RaShad got 24 questions out of 30 correct on a test.
(a) What percent did he get wrong? (20 or 20%) -8 pts
(b) How many more questions would he have needed to answer correctly to have scored 90%? (3) -12 pts

3. TOSSUP: What is the common name given to a regular hexahedron? (cube) -10 pts

BONUS: A square-based pyramid has a base length of 6 inches and a height of 4 inches. What is the surface area of the pyramid in square inches? (96 or 96 sq. in.) -20 pts

4. TOSSUP: If you throw a fair die, numbered 1 through 6, what is the probability that you will throw a 2, 3, or 4? $\left(\frac{1}{2} \text{ or } .5 \text{ or } 50\%\right)$ -10 pts

BONUS: Five red marbles and three blue marbles are placed in a bag. One marble is drawn from the bag, then a second marble is drawn without replacing the first. What is the probability that the first marble is blue and the second is red? $\left(\frac{15}{56}\right)$ -20 pts

5. TOSSUP: If five students split the cost of a \$20 pizza bill evenly, what must each student pay? (\$4) -10 pts

BONUS: According to the latest L. L. Bean catalog, sleeping bags cost \$50 for the junior size, \$55 for the regular size, and \$65 for the extra-large size. The Smith family needs two juniors, one regular, and one extra large. The Johnson family needs one

junior, three regulars, and one extra large. If the two families send in their order together, their shipping charge will be \$6. They decide to split this charge in the same proportion as their bill for the sleeping bags. How much money of the \$6 must the Johnsons pay? (\$3.36) -20 pts

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6. TOSSUP: If \$9.63 is to be divided equally among 3 people, how much will each person receive? (\$3.21) -10 pts
BONUS: What is the total cost of an item marked \$201.32 after a discount of 25% and sales tax of 6%? (Round to the nearest cent) (\$160.05) -20 pts

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7. TOSSUP: Using the correct unit of measure, give the area of a triangle with base 8 cm and height 2 cm. (8 sq. cm.) -10 pts
BONUS: The perimeter of an equilateral triangle is 24 cm. Using the correct unit, find the area of the triangle to the nearest hundredth. (27.72 sq. cm) -20 pts

TIEBREAKER: The fraction $\frac{19}{20}$ is equivalent to what percent? (95 or 95%) -10 pts
