

ROUND 1

1. TOSSUP: The fraction $\frac{3}{4}$ is equivalent to what percent?
BONUS: (a) How much money is 10,000% of one penny?
(b) What is your weekly salary if you get a 5% increase, and your previous wages were \$10 per hour, 40 hours per week?
2. TOSSUP: What is the lowest common denominator for the fractions $\frac{11}{12}$ and $\frac{3}{8}$?
BONUS: Find the sum of the least common multiple and the greatest common factor of the numbers 13, 26, and 39.
3. TOSSUP: What is the area of a square whose perimeter is 20?
BONUS: What is the difference in areas between a square that is 4 feet on a side and a circle whose diameter is 4 feet? Use $\pi = 3.14$ and include the appropriate unit of measure.
4. TOSSUP: What is the cost of five cans of soup at 98¢ per can?
BONUS: In a certain country the inflation is so bad that the price of a can of soup triples every year. If a can of soup costs 98¢ today, what will it cost exactly 6 years from now?
5. TOSSUP: A common size for soft drink bottles is 2 liters. How many milliliters is this?
BONUS: (a) How heavy is two liters of water at 4 degrees celsius? (Give your answer in grams or kilograms.)
(b) If two liters of water were poured into a rectangular container whose inside base measured 25 centimeters by 16 centimeters, how many centimeters high would the water fill?
6. TOSSUP: What is the formula for the volume of a right circular cylinder?
BONUS: Tell how the volume of a cylinder is affected in each of the following cases:
(a) if the radius is halved, that is, divided by 2?
(b) if the height is doubled?
(c) if the radius is halved and the height is doubled?
7. TOSSUP: [Read slowly enough for calculation to be done mentally.] Perform the following calculation. I will say OK when I get to the end of the expression.
30 divided by 6 times 3 plus 9. "OK"
BONUS: Twenty added to the product of a certain number and ten is equal to 40. Find that number.

ROUND 2

1. TOSSUP: What is one half of one fourth?
BONUS: Simplify the quotient formed by dividing the sum of two and one half and one third by the difference between four and one third and one and one fourth. Express your answer as a fraction in lowest terms.

2. TOSSUP: What is the sum of negative ten and positive ten?

BONUS: (a) What is the product of negative 10, negative 3, negative 5 and negative 4?

(b) What is negative two and one half divided by positive one and one fourth?

3. TOSSUP: You have only quarters and dimes. Tell how many of each to use to make a total of 65¢.

BONUS: A teller's supply of dimes and nickles totals \$3.60. If the teller's number of dimes is one more than three times the number of nickels, how many dimes are there?

4. TOSSUP: If Brian was given 75¢ on Monday, and that represented 25% of his weekly allowance, then what is Brian's weekly allowance?

BONUS: (a) A company hired Mr. Allen to collect their rents. If he received a two and one half percent commission, how much commission did he receive for collecting \$960?

(b) What were the net proceeds for the company?

5. TOSSUP: In the Pythagorean Theorem equation $a^2 + b^2 = c^2$, what do the letters a, b, and c represent?

BONUS: If two of the sides of a right triangle have lengths 4 and 7, what are the possible exact lengths of the other side of the triangle?

6. TOSSUP: If the ratio of students to teachers is ten to one, and there are 40 teachers, how many students are there?

BONUS: Suppose the three angles of a certain triangle are proportional to the three numbers 2, 3, and 5. What are the degree measures of the three angles?

7. TOSSUP: Give the greatest common factor of 12 and 20.

BONUS: Give the least common multiple of the numbers 2, 3, 4, 5, 6, 7, 8, 9, and 10.

ROUND 3

1. TOSSUP: If a normal dime is flipped two times, what is the probability that both flips will result in heads?

BONUS: In a drawer there are 4 blue socks, 6 black socks, 8 red socks, and 10 brown socks. What is the minimum number of socks a person must select in order to assure having 2 socks of the same color?

2. TOSSUP: What is the sum of the two acute interior angles of a right triangle?

BONUS: A 10 meter pole is supported in a vertical position by a 6 meter guy wire attached part way up the pole. If one end of the wire is fastened to the ground at a 60 degree angle, how far from the base of the pole is the point where the guy wire meets the ground?

3. TOSSUP: Give the reciprocal of the mixed number one and one fourth.

BONUS: What is two and one eighth divided by negative one and three twelfths? Express in lowest terms.

4. TOSSUP: Five hundred millimeters equals how many centimeters?

BONUS: A large rectangular box has a volume of 6 cubic meters.

(a) How many cubic centimeters is this?

(b) How many cubic millimeters is this?

5. TOSSUP: What is seven factorial divided by six factorial?

BONUS: A 5-letter string means any set of 5 letters written in a row, whether or not it forms a real word. How many different 5-letter strings are there that could be formed from the letters in the word "answer"?

6. TOSSUP: Give the Roman numeral that represents the double of the Roman numeral V.

BONUS: (a) Give the base 6 numeral that represents the double of the numeral "two three, base 6".

(b) Give the base 4 numeral that represents the double of the numeral "two three, base 4".

7. TOSSUP: Express the fraction one eighth as a percent.

BONUS: (a) One half percent of one thousand is what number?

(b) What is one and one half percent of ten thousand?

ROUND 4

1. TOSSUP: Divide the quantity five squared minus two squared by three.

BONUS: A direct dial call from Boston to Australia costs \$3.17 for the first minute and \$1.19 for each additional minute. A station-to-station operator-assisted call costs \$9.45 for the first three minutes and \$1.19 for each additional minute. How much money would you save by dialing direct for a 5-minute call?

2. TOSSUP: What is two raised to the negative third power?

BONUS: Divide six to the eighth power by three to seventh power.

3. TOSSUP: What is the mean of the numbers 2, 8, 8, and 10?

BONUS: A group of nine students were asked how much allowance each received during the week. They received \$5, \$4, \$5, \$7, \$5, \$4, \$6, \$3, and \$5. To the closest whole cent, find the:

(a) mean

(b) median

(c) mode

4. TOSSUP: What is the difference between 5 and the mixed number one and three fourths?

BONUS: An airplane flew 945 kilometers in two and one fourth hours. What was its average ground speed? Give the appropriate unit of measure.

5. TOSSUP: What is 80% of 200?

BONUS: After cutting off 20% of a length of ribbon, the remaining length was 20 meters. How many meters long was the original ribbon ?

6. TOSSUP: How many obtuse interior angles does an obtuse triangle have?

BONUS: A certain right triangle has perpendicular sides of length 15 and 20.

- (a) Give the area of this triangle.
- (b) Give the perimeter of this triangle.

7. TOSSUP: What is one third of three fourths?

BONUS: What is the sum of the product $\frac{3}{4}$ times $\frac{4}{3}$ and the product $\frac{7}{10}$ times $\frac{4}{5}$? Express as a fraction in lowest terms.

ROUND 5

1. TOSSUP: What is the sum of the first three prime numbers?

BONUS: The total number of pages in a certain book is a multiple of 32. If it contains eight pages of introductory material and eleven chapters, each with 24 pages, what is the smallest possible number of additional pages required?

2. TOSSUP: What is 8 divided by $\frac{1}{2}$?

BONUS: Find one ninth of the sum of the fractions $\frac{1}{8}$, $\frac{2}{8}$, $\frac{3}{8}$, $\frac{4}{8}$, $\frac{5}{8}$, $\frac{6}{8}$, $\frac{7}{8}$, and $\frac{8}{8}$. Express in lowest terms.

3. TOSSUP: What is the degree measure of an acute angle in an isosceles right triangle?

- BONUS:
- (a) Two angles of a triangle have measures of 72 and 43 degrees. Find the degree measure of the third angle?
 - (b) The largest angle in a certain isosceles triangle is ten times as large as each of the other angles. What is the degree measure of the largest angle?

4. TOSSUP: I have 5 pieces of paper. Each paper shows 4 large stars and 3 small stars. How many stars do I have in all?

BONUS: The following is a quote from a recent Newsweek article: "A single forest tree absorbs 26 pounds of carbon dioxide per year; an acre of trees can remove 2.4 to 5 tons of carbon dioxide [yearly]..." Using the average of the two estimates, 2.4 tons and 5 tons, calculate the number of trees in an acre.

5. TOSSUP: What is the one fifth of the difference between 80 and 20?

BONUS: Mary is one fifth as old as her grandmother. In 4 years the sum of their ages will be 80. How old is each now?

6. TOSSUP: If a pair of normal dice are rolled, what is the probability that the sum is 13?

- BONUS: (a) If a single normal die is rolled three times, what is the probability that it will come up 6 all three times?
(b) What is the probability of drawing a red ace out of a normal bridge deck of 52 cards?

7. TOSSUP: What is the name for a quadrilateral with 4 congruent sides and 4 congruent angles?

- BONUS: If the area of a rectangle is 24 square inches and the width of the rectangle is 4 inches, find the perimeter of the rectangle, using the proper unit of measure:

ROUND 6

1. TOSSUP: What is the length of the hypotenuse of a right triangle with sides 15 and 20?

- BONUS: (a) A sailboat has a sail in the shape of a right triangle. If the hypotenuse measures 15 meters and one side 12 meters, what is the area of the sail?
(b) If the height and the width of this sail are cut in half, what is the area of the sail? Give each answer in the correct unit of measure.

2. TOSSUP: How much simple interest is earned in one year on a deposit of \$200 at a five and one half percent annual rate?

- BONUS: (a) Find the amount of simple interest when \$1000 is invested at 8% per year for 18 months.
(b) How much money would have to be invested for three years at 8 % per year in order for the simple interest to be \$72?

3. TOSSUP: Eleven twenty-fifths of a dollar equals how many cents?

- BONUS: Jan wants to earn \$225 to buy a cassette player. So far, she has earned \$52.50 at her afternoon job. If she works 3 hours each afternoon, and earns \$2.50 an hour, how many more afternoons must she work?

4. TOSSUP: If the diameter of a circle is eleven and one half centimeters, how long is its radius?

- BONUS: Using the approximation $\pi = 22/7$, and giving your answers in the correct units of measure, find the:
(a) area and the
(b) perimeter of a semicircle with radius 14.

5. TOSSUP: The decimal fraction usually read as “point 2 repeat” is a decimal fraction with a 2 in each of the infinitely many places to the right of the decimal point. What regular proper fraction in lowest terms is equivalent to “point 2 repeat”?

- BONUS: Express as a proper fraction in lowest terms, the repeating decimal “point three seven two seven two seven two, etc.” That is, the decimal fraction with 3 in the tenths place, and repeating seven two after that.

6. TOSSUP: What is the name for a quadrilateral with only one pair of parallel sides?

- BONUS: (a) What is the area of a trapezoid with a height of 6 and parallel bases of lengths 10 and 12?
(b) What is the area of a trapezoid with parallel sides of length 10 and 4, if its two nonparallel sides each have length 5?

7. TOSSUP: Give the additive inverse of negative $\frac{3}{4}$.

BONUS: For each of the following, assume that the number mentioned is not zero.

- (a) The sum of a number and its own additive inverse equals what?
(b) The product of a number and its own multiplicative inverse equals what?
(c) Dividing a number by its own additive inverse results in what?
(d) Dividing a number by its own multiplicative inverse results in what?

ROUND 7

1. TOSSUP: What is negative 625 divided by 25?

- BONUS: (a) Find the product of negative 5, negative 7, positive 4, and negative 1.
(b) Divide negative 36 by negative one sixth.

2. TOSSUP: What is the square root of 144?

- BONUS: (a) The square root of 85 is between what consecutive integers?
(b) The cube root of 500 is between what consecutive integers?

3. TOSSUP: What is the sum of the first four positive multiples of 10?

BONUS: How many numbers between 50 and 100 are divisible by 3?

4. TOSSUP: What is the name for a triangle with at least two congruent sides?

BONUS: The perimeter of an isosceles triangle is 36. The base is 3 shorter than each of the equal sides.

- (a) Find the length of the base.
(b) Find the area of this triangle.

5. TOSSUP: Express as a decimal the third power of two tenths.

- BONUS: (a) What is the ninth power of 2?
(b) What is the product of two to the ninth power times five to the ninth power?

6. TOSSUP: If a team wins 16 games and loses 4 games, what percent of its games did it win?

BONUS: In baseball, a batter is credited with 4 total bases for each home run, 3 total bases for each triple, 2 total bases for each double, and 1 total base for each single. Then his slugging percentage is computed by dividing his number of total bases by his number of times at bat. A player's batting average is computed by simply dividing his total number of hits by his number of times at bat.

Suppose Jose Canseco comes up to bat 50 times, hitting 3 home runs, 1 triple, 6 doubles, and 8 singles, and makes an out every other time.

- (a) Compute his batting average, as a three place decimal.
(b) Compute his slugging percentage, as a three place decimal.

7. TOSSUP: If a triangle has two angles, each measuring 40 degrees, what is the degree measure of the third angle?

BONUS: If, in a triangle ABC, angle A is 6 times as large as angle B, and the measure of angle B is 17 degrees and 20 minutes, what is the measure of angle C?