College Bowls

9th & 10th

SETS 1-6

w/Extra Questions at the end.

COLLEGE BOWLS INSTRUCTIONS

Read these to the competitors before first round:

COLLEGE BOWLS - up to 10 minutes per round – 10 problems per round – 10% of team score

1. *All competitors must be facing the front of the room in one row. All spectators need to be behind the competitors.*
2. *A maximum of ten questions per round will be scored. It is OK for both teams to score the same number of points! The proctor will record the points earned on each team's score sheet.*
3. *You may use scratch paper and pencil. You may talk with your teammates while arriving at a solution. An Electronic College Bowl Apparatus (CBA) will be used to identify the first team to have an answer.*
4. *During these rounds, the questions will be read twice and a maximum time of 45 seconds will be allowed for you to answer after the second reading of the question is complete. If a team buzzes in after the second reading and gives an incorrect response, the other team has the remainder of the 45 seconds to respond. You may interrupt (buzz in) while a question is being read, however, if you do, the proctor will stop and an immediate response is needed. If the correct response is given, a new question will be asked. Otherwise, the question will be reread for the other team, making sure it has two full readings. Forty-five seconds will be given for the team to respond from the completion of the last reading. If an immediate response is not given after a team pulls the string, their lack of an answer in a timely manner is considered incorrect. In the event that only one team is competing in a round (i.e., one team is absent), the team competing will have a maximum of 30 seconds in which to buzz in.*
5. *You do not need to wait to be acknowledged by the proctor; however, it is your right to do so if you would like to be acknowledged.*
6. *If two students from the same team answer at the same time with different answers, the answer will be considered incorrect.*
7. *If a problem arises with one of the questions, an extra question will be asked to replace that question. There is only one extra question per round. If the round finishes early, you need to stay in the room for the remaining time.*

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COLLEGE KNOWLEDGE BOWL ROUND #1 – SET 1

#	Problem	Answer
1	What is the probability of rolling a sum of 7 with two fair-sided dice? Express as a fraction.	1/6
2	Find the sum of the first five cubes.	225
3	What is the sum of the reciprocals of the two largest single digit positive integers?	17/72
4	Two vertical angles have measures of 7 "x" plus 17 degrees and 8 "x" plus 2 degrees, respectively. Find x.	15 [degrees]
5	How many digits does the quotient 1000 to the 300 power divided by 100 to the 200 power have?	501
6	True or False: In probability, if A and B are two disjoint events, then they are always independent.	False
7	From a group of 5 men and 7 women, how many ways can a committee of 2 men and 2 women be formed?	210
8	A triangle has side lengths 13, 13, and 10. Find the sum of the triangle's area and perimeter.	96
9	What is the remainder when six factorial is divided by 7?	6
10	Blossom, Bubbles, and Buttercup have 10 pieces of candy. How many ways can they divide the candies among them if each person must receive at least one piece?	36 [ways]

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COLLEGE KNOWLEDGE BOWL ROUND #2 – SET 2

#	Problem	Answer
1	How many composite numbers are there between 20 and 30, inclusive?	9 [numbers]
2	What is 150 percent of 30 percent of 2 percent of 356,000?	3204
3	A square has a diagonal length of 7 times the square root of 2. What is its perimeter?	28 [un]
4	Two right circular cones have volumes that are equal. One cone has a radius that is 3/5 that of the other one. What is the ratio of the height of the shorter cone to the height of the taller cone? Answer as a common fraction.	9/25
5	Nina has a right, circular cylinder of volume 10. If Nina doubles the radius of the cylinder, what is the new volume of the cylinder?	40 $[un^3]$
6	What is the largest prime factor of 2014?	53
7	Mr. Norris practically has an infinite supply of 7-cent and 3-cent stamps. What is the largest postage amount, in cents, that Mr. Norris *cannot* attain using a nonnegative amount of the stamps?	11
8	What is the 9^{th} digit after the decimal point in the decimal representation of 3/7?	8
9	What is the mean of all the 5-digit numbers that can be formed using the digits 1, 2, 3, 4, and 5 exactly once each?	33333
10	Viren is dealt a pair of queens in a poker game. Three additional cards are turned over. What is the probability that these three cards contain exactly one queen?	141/1225

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COLLEGE KNOWLEDGE BOWL ROUND #3 – SET 3

#	Problem	Answer
1	Three consecutive integers sum to 729. What is the sum of the digits of largest integer?	10
2	If "f of x" equals three point five x plus 12, then what is "f of 500" minus "f of 470?"	105
3	The measures of the three angles in a triangle are the quantities: x plus 20 degrees, x degrees, and the quantity 210 minus 3x degrees. Find the value of x.	50
4	Mount Rainier students are selling chocolate models of their school as a fundraiser. A small replica sells for $1.50. What should be the price, in dollars, of a replica with all dimensions doubled, if the cost per gram is to remain unchanged?	[$] 12.00
5	If "f of x" equals 6x plus 5, what is f inverse of 8?	1/2
6	Richard was adding the positive integers up to 52, but accidentally skips one, getting a total of 1341. Which integer was skipped?	37
7	A parabola with an axis of symmetry parallel to the y-axis with a vertex at the point 8 comma negative 2, crosses the x-axis at the point negative two comma zero. At what other point does it cross the x-axis?	(18,0) or eighteen comma zero
8	Emily earned $12,000 last year tutoring students in economics. She invested part at 8% per year simple interest and the rest at 9% per year simple interest. She made a total of $1050 in interest in one year. How much did she invest, in dollars, at 8% interest?	[$] 3000
9	A rectangle is inscribed in a circle with an area of 100 pi. If the ratio of the lengths of the sides of the rectangle is four to three, what is the area of the rectangle?	192 [sq un]
10	Find the largest root of x cubed minus 13x plus 12.	3

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COLLEGE KNOWLEDGE BOWL ROUND #4 – SET 4

#	Problem	Answer
1	Find the slope of the line that goes through the point seven comma eleven and the point twenty comma thirteen. Express the slope as a fraction.	2/13
2	What is the probability that I get less than 3 heads when I flip a fair coin three times? Express as a common fraction.	7/8
3	How many points with integer coordinates are exactly 5 units away from (0, 0)?	12
4	The 3rd and 6th terms of an infinite geometric sequence are 64 and 8, respectively. What is the sum of the infinite sequence?	512
5	If *n* is a positive integer, what are the possible remainders when *n* cubed is divided by 9?	0, 1, and 8
6	Jeff buys a sandwich that costs him $12.25. After tax, it costs him $13.23. Calculate the rate of tax. Express as a decimal.	0.08
7	When three cards are drawn from a standard 52-card deck without replacement, what is the probability that they contain exactly two cards of the same rank, for example two queens?	72/425
8	What is the product of the values of k that make x squared plus kx plus 49 a perfect square trinomial?	-196
9	Find the sum of the arithmetic sequence 6, 15, 24, and so on until 132.	1035
10	Expressed in base 8, what is the largest 4-digit number in base 4?	377 [base 8]

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COLLEGE KNOWLEDGE BOWL ROUND #5 – SET 5

#	Problem	Answer
1	Suhmiin has 10 pairs of jeans, 21 shirts, and 7 pairs of shoes. If an outfit consists of a pair of jeans, a shirt, and a pair of shoes, how many outfits can Suhmiin make?	1470 [outfits]
2	What is the twelfth number in the "Fibonacci" sequence starting with 1 comma 1?	144
3	What is the total cost, in dollars, of an 18-dollar toy after a 9 percent tax has been applied?	[$] 19.62
4	Find the sum of the first 123 positive odd integers.	15129
5	The fifth element of an arithmetic sequence is 10 and the eleventh element is 20, what is the sum of the seventh and ninth elements?	30
6	What is the area of the circle that circumscribes a triangle with side lengths of 6, 8 and 10?	25 pi [sq un]
7	How many positive integer divisors of 2592 are perfect squares?	9
8	As a common fraction, find the ratio of the value of the area of a regular hexagon with side length 2 to the value of its perimeter.	$\frac{\sqrt{3}}{2}$ or square root of 3 over 2.
9	Where *i* is the square root of negative one, what is 2 divided by the quantity 1 minus *i*, in the form of *a* plus *bi*?	$1 + i$
10	Given that the points five comma three and the point negative one comma five are on a circle, find the equation, in slope-intercept form, for the line that contains all possible centers for the circle.	$y = 3x - 2$

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COLLEGE KNOWLEDGE BOWL ROUND #6 – SET 6

#	Problem	Answer
1	Three angles of a convex pentagon are 100, 120 and 140 degrees, if the remaining angles have the same measure as each other, in degrees, what is that measure?	90 [degrees]
2	What is the sum of the first 10 triangle numbers: 1 plus 3 plus 6 plus 10 and so on?	220
3	How many of the positive integer factors of 800 are odd?	3
4	What is the area in square centimeters of a square with perimeter 188 centimeters?	2209 [sq cm]
5	What is the sum of the perfect squares less than two hundred?	1015
6	For what value of "c" does the quadratic 3 x-squared plus 2x plus "c" have exactly one root?	[c =] 1/3
7	What are the coordinates of the point that is two-thirds of the way from the point one comma one to the point four comma negative five?	$(3, -3)$ or 3 comma negative 3.
8	Let "f of x" equal the quantity 2x minus 5 divided by the quantity x plus 1. What is f inverse of 3?	-8
9	What is the area inside the curve $2x^2 + 18y^2 = 36$?	6π [sq un]
10	Trung and Berta are playing a game. Trung has a fair 8 sided die and Berta has a fair coin. Trung goes first. If Trung rolls a 1, 3, 5, 7, or 8 he wins. Otherwise it is Berta's turn. If Berta flips a head she wins, otherwise it is Trung's turn again. Play continues until someone wins. What is the probability Berta wins?	3/13

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COLLEGE KNOWLEDGE BOWL ROUND – EXTRA

#	Problem	Answer
1	Consider a sequence defined by "a" sub "n" equals negative one to the nth power times n. What is the sum of the first 100 terms?	50
2	What is the perimeter of the triangle with vertices at the origin, the point 4 comma 6 and the point 8 comma 0?	$8 + 4\sqrt{13}$ 8 plus 4 root 13. [units]
3	The decimal zero point three four in base 6 represents what common fraction in base 10?	11 / 18
4	A committee consists of 4 boys and 4 girls. How many subcommittees of size 4 can be made if there must be at least one boy and one girl?	68
5	What is the fourth root of sixteen to the third power?	8
6	Rounded to the nearest tenth, what is the square root of 85?	9.2