

College Bowls

11th & 12th

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	Express your answer as a decimal. If the log of x equals one point three and the log of y equals negative zero point two, what is the log of the quantity y squared x?	0.9 or zero point nine
4	Two vertical angles have measures of 7 "x" plus 17 degrees and 8 "x" plus 2 degrees, respectively. Find x.	15 [degrees]
5	Simplify: i to the 291 st power plus i to the 263 rd power plus i to the negative 3 power.	-i or negative i
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 maximum value of the function f of x equals 4x minus 15 x-squared?	4/15
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	What is the period of "f of x" equals 3 times the tangent of the quantity 5x minus 1?	$\pi/5$
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	A 60-degree arc of a circle has a length of 18. What is the area of the circle?	$2916/\pi$ [un^2]
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 <i>cannot</i> 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	Eric wants to buy 6 flowers. If he can choose from dahlias, daisies, and daffodils, each in unlimited supply, how many different collections of flowers can he buy?	28
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	What is the area of a triangle with sides having lengths of 13, 14, and 15?	84 [sq un]
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	List any solutions in quadrant 4 between 0 and 2π in radians to the equation cosine x equals negative square root of 3 over 2.	No solutions
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	How many integers from 1 to 500, inclusive, are not divisible by: 3, 4, 8, 9, or 12?	250 [integers]
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	What is the logarithm base 6 of 4 plus the logarithm base 6 of 9?	2
4	The 3 rd and 6 th terms of an infinite geometric sequence are 64 and 8, respectively. What is the sum of the infinite sequence?	512
5	When sine squared of the quantity pi over 8 is expressed in the form A plus B square-root 2, where A and B are rational, what is A plus B?	$1/4$
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	How many times does the graph of y equals x-cubed minus 3 x-squared plus 4 touch the x-axis?	2
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	In radians, what is the smallest positive angle in the second quadrant has a cosine equal to negative one-half?	$2\pi / 3$
4	Find the sum of the first 123 positive odd integers.	15129
5	What is the square of the quantity: sine of 15 degrees plus cosine of 15 degrees?	$3 / 2$
6	What is the area of the circle that circumscribes a triangle with side lengths of 6, 8 and 10?	25π [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	What is the distance between the vertex and the focus of the parabola: y equals $8x$ -squared plus $5x$ minus 5 ?	2
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	The quantity x plus y plus z is raised to the third power. After like terms are combined, what is the number of terms?	10 [terms]
4	What is the area in square centimeters of a square with perimeter 188 centimeters?	2209 [sq cm]
5	If i is the square root of negative one, what is the quantity 1 plus i raised to the eighth power?	16
6	For what value of “ c ” does the quadratic $3x^2 + 2x + c$ 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 of the shape enclosed by the polar graph $r = 2 \sin \theta$?	π [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

Extra