Name: _____

Hoped-for Major: _____

Math 102: Math for Liberal Arts
Sample Final Exam

Read each question carefully, answer each question completely, and show all of your work.
Write your solutions clearly and legibly; no credit will be given for illegible solutions.
Remove sunglasses and brimmed hats.
Turn your cell phones off.
No notes, human assistance, or cheat-sheets.

Each problem is worth 2 points.

1. Draw a complete graph with vertices labeled A, B, C, D, E.

2. Draw a graph that is not connected. Clearly label your vertices.

3. Draw a graph that has an Euler path (contains every edge once) but not a Hamiltonian path (contains every vertex once).

4. Draw a graph that has a Hamiltonian path, but not an Euler path.

5. The solution to the equation $x + 2 = 3(x - 4)$ is

6. The next 2 terms of the sequence $7, 3, 0, -2, -3, -3, \ldots$ are

7. The solution to the equation $\frac{x+2}{2} = 3(x + 4)$ is

8. Rewrite $\frac{1}{3} + \frac{3}{5}$ as a single fraction in lowest terms.

9. Evaluate $0!$.

10. A basketball team has 11 players, but only 5 of them can be on the court at the same time. How many ways are there to select 5 team members to start the game? The answer is at least one of: $11, 11 \cdot 5, 11!, \frac{11!}{5!}, C(11,5)$, $P(11,5)$, $55440, 462$.

11. In the New York State Lotto, the probability that a single ticket wins is 0.0000000111. What is the probability, expressed as a percentage (and don't round!), that a single ticket loses?

12. Two fair dice are rolled. What is the probability that the sum is 7?

13. Two fair dice are rolled. What is the probability that the sum is at least 7?

14. Thirty people are in a room. Is the probability that at least two of the people have the same birthday greater than 1/2, less than 1/2, exactly 1/2?

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15. The chests of Scottish militiamen are normally distributed with mean 39.7 inches and standard deviation 3 inches. What percentage of Scottish militiamen have a chest measurement between 36.7 and 42.7 inches?

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16. What is the probability that the next 5 times you fairly flip a coin, you get heads all five times?

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17. A half mile has 880 yards, and a yard is 3 feet. If a runner is moving at 5 miles per hour, how many feet per second is she moving?

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18. Three-fifths of my clothes are old. How many of my 20 shirts are old?

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19. Suppose that children are equally likely to be born girls or boys (this is almost true). If I tell you that I have two children, and that my oldest child is a girl, what is the probability that my two children are both girls?

20. Suppose that children are equally likely to be born girls or boys (this is almost true). If I tell you that I have two children, and that at least one is a girl, what is the probability that my two children are both girls?

21. A sampling of IQs gives 100, 105, 108, 109, 109, 111, 131. What is the mean?

22. A different sampling of IQs gives 100, 101, 108, 108, 110, 119. Is the standard deviation greater than 10 or less than 10?

23. (Taken from www.perplexus.info).

Look at the 5 statements below (in the column at right is the name of the person who made it):

A	I tell the truth.	BOB
B	KEVIN doesn't tell the truth.	TOM
C	JIM tells the truth.	KEVIN
D	BOB tells the truth.	JIM
E	TOM tells lies.	LENNY

Only one of the 5 people is telling the truth. Remove the name of the truth-teller and place the names of the remaining 4 in the same order in the next board, i.e., *if* KEVIN is telling the truth, KEVIN will be removed and in the board below you will place the names BOB (in line F), TOM (in line G), JIM (in line H) and LENNY (in line I), in the column at right.

F	JIM told the truth in the grid above.	
G	I was in position B in the grid above.	
H	The person in position F is telling the truth.	
I	I am not JIM.	

Only 1 of the 4 people is telling the truth. Remove the truth-teller from the line-up and proceed as above with the remaining 3 names.

J	The person in position K is telling a lie.	
K	I was not in position G above.	
L	The person in position J is telling a lie.	

Only 1 of the 3 people is telling the truth. Remove the truth-teller from the line-up and proceed as above with the 2 remaining names.

M	The person in position N is telling a lie.	
N	I am JIM.	

Only 1 of the 2 people is telling the truth. Remove the truth-teller from the line-up.

Who is the consistent liar ?