MA 111   **Full name:** _____

Fall 2021

Mini-exam 2B

10/1/2021   **Student ID number:** _____

I want you to do your best on this mini-exam, so I can see how much you've learned. Be sure to read each question carefully and write clearly. Show your work, and explain it where necessary, so you can earn partial credit even on questions where you make a mistake.

This mini-exam contains 3 pages (including this cover page) and 13 questions. Please keep the pages stapled together. The total number of points is 40. You may use a calculator. If you need more space for scratch work, please use the back page.

Good luck!

---

1. (3 points) Some dice have more than just six sides. If you roll a 12-sided die, what's the probability that the result is divisible by four?

Suppose you draw a marble at random from a jar which contains several marbles of different colors and materials, described by the table below. Use this data to answer questions 2 through 7.

	Glass	Steel	Plastic	**Total**
Purple	2	6	5	13
Yellow	2	19	14	35
Red	8	7	4	19
Total	12	32	23	67

2. (3 points) What is the probability that the marble is Red?

3. (3 points) What is the probability that the marble is Purple **and** Steel?

4. (3 points) What is the probability that the marble is Purple **or** Steel?

5. (3 points) What is the probability that the marble is Purple **and** Yellow?

6. (3 points) What is the probability that the marble is Purple **or** not Glass?

7. (3 points) What is the probability that the marble is Glass **given** that it's Yellow?

A deck of cards contains 5 suits (labeled A-E) and 8 ranks (numbered 1-8), but the deck is missing the cards D7, E6, and E7. Suits A and B are white, while suits C, D, and E are gray (see the image to the right). Use this deck to answer question 8 through 13, about a card being drawn at random.

A1	A2	A3	A4	A5	A6	A7	A8
B1	B2	B3	B4	B5	B6	B7	B8
C1	C2	C3	C4	C5	C6	C7	C8
D1	D2	D3	D4	D5	D6		D8
E1	E2	E3	E4	E5			E8

8. (3 points) How many cards are in the deck?

9. (3 points) What is P(suit B)?

10. (3 points) What is P(suit B | rank 6)?

11. (4 points) What is P(rank 7 ∪ gray)? (It may help to circle the corresponding cards in the image above.)

12. (3 points) Using your answer to number 11, what is the probability that you *don't* draw a card that is rank 7 or gray?

13. (3 points) Which of the following represents the **complement** of rank 7 ∪ gray?

     ○ not rank 7 ∪ not white

     ○ not rank 7 ∩ not white

     ○ not rank 7 ∪ white

     ○ not rank 7 ∩ white