

Term: Winter 2024

Name: \_\_\_\_\_

Instructor: Patricia Wrean

**MATH 156**  
**Test 1, Version B**

**Total =  $\overline{25}$**

- All of the work on this test must be your own.
- You may use a scientific calculator. You may not use a calculator with graphing capability or a smartphone app. You may not share calculators between students.

**GOOD LUCK!**

1. (7 points) Convert the following numbers into the indicated base. Give exact answers (do not round) and show your work.

(a)  $31201_4$  to decimal

\_\_\_\_\_

(b)  $7A.39_{16}$  to octal

\_\_\_\_\_

(c) 0.28 to hexadecimal

\_\_\_\_\_

2. (4 points) Convert 50.6875 to base 8. Give an exact answer (do not round) and show your work.
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3. (1 point) Consider the number  $FAC E_{15}$ . Is this a legal number in base 15? Explain briefly.

4. (3 points) For the pair of sentences below, is the second the negation of the first? Answer by selecting the correct choice.
- (a) Every plant is blooming. No plant is blooming. Yes / No
- (b) There are no bugs in this program. There are one or more bugs in this program. Yes / No
- (c) Less than four cars are hybrids. At least four cars are hybrids. Yes / No
5. (3 points) Answer the questions given the following situations with “Yes”, “No”, or “Maybe”.
- (a) Priya likes pop music. Does she like pop and jazz music? Yes / No / Maybe
- (b) Kirsten does not like pop music. Does she like pop or jazz music? Yes / No / Maybe
- (c) Rinka likes classical and pop music. Does she like classical music? Yes / No / Maybe
6. (3 points) Let  $p$  denote “This dish needs pepper.” and  $q$  denote “This dish needs salt”. Rewrite the following English sentences in terms of logical symbols (i.e.  $p \wedge q$ ,  $p \vee q$ ). Do not simplify!
- (a) This dish needs salt or pepper. \_\_\_\_\_
- (b) This dish needs salt but not pepper. \_\_\_\_\_
- (c) It is not true that this dish needs both salt and pepper. \_\_\_\_\_

7. (4 points) Represent  $(p \vee r) \wedge (\sim p \wedge \sim q)$  on the following Venn diagram by shading in the appropriate regions. Show intermediate steps on separate sketches and label them clearly to get full credit.

Note: if you want, you can use the blank Venn diagrams on the next pages. Just make sure to label them clearly.





