

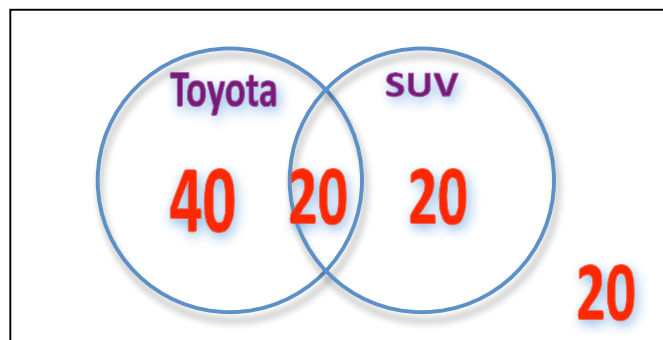
## Math 1300 Examination 1

**Directions:** Read all problem directions and follow them. Write neatly and include all work for computation problems. Writing in a sloppy manner or failing to show work will result in point deductions. Write your name in the bottom left-hand corner of the last exam page for three bonus points. You have 55 minutes to complete this examination. Use your time wisely!

1. This problem involves classification of numbers.
  - a. Circle all numbers below that belong in the set of RATIONAL numbers. **(7 pts)**
    - i.  $-3$  \*\*\*
    - ii.  $2.4532009\dots$
    - iii.  $43$  \*\*\*
    - iv.  $-1.4384444\dots$  \*\*\*
    - v.  $-2$  \*\*\*
  - b. Circle all numbers that are in the set of INTEGERS numbers. **(7 pts)**
    - i.  $21$  \*\*\*
    - ii.  $2.5471297\dots$
    - iii.  $-15$  \*\*\*
    - iv.  $79$  \*\*\*
    - v.  $\pi$
  - c. Write the set notation representation for the counting numbers. Include a number line representing the set. **(6 pts)**

Counting Numbers:  $\{1, 2, 3, \dots\}$

2. In a survey of 100 car owners the following information was determined. Every person owned exactly one car and it was either a Nissan or a Toyota. Each vehicle was either a pickup or a sport utility. There were 60 Toyota vehicle owners in the survey. Of these, one third drove an SUV. Half of the Nissan owners drove a pickup.
  - a. Draw a Venn diagram to represent the information given in the problem. Show all computations! Label each region of the Venn diagram. **(10 pts)**



There are other possible diagrams, but ALL will have the above numbers.

- b. SUV and Toyota are examples of what kind of set relationship? (5 pts)
- Subset
  - Disjoint sets
  - Overlapping sets \*\*\*
- c. How many SUV owners were there in this survey? How did you determine your answer? (5 pts)

20 Toyota SUV drivers + 20 Nissan SUV drivers = 40 SUV drivers

3. Answer the following:

- a. Convert the following decimals into percents (6 pts)
- 1 = 100%
  - .25 = 25%
  - 5.78 = 578%
  - .0045 = -.45%
- b. Convert the following percents to fractions (REDUCE ALL FRACTIONS) (7 pts)
- 23% =  $\frac{23}{100}$
  - 150% =  $\frac{3}{2}$
  - .6% =  $\frac{.6}{100} = \frac{6}{1000} = \frac{3}{500}$
  - 7.5% =  $\frac{7.5}{100} = \frac{75}{1000} = \frac{15}{200}$
- c. Which of the following are propositions? (7 pts)
- "Why did you do that?"
  - "Jason is a police officer and Hawai'i is a state." \*\*\*
  - "Four score and seven years ago our..."
  - $5+10=500$  ("Five plus ten equals five hundred") \*\*\*
  - "Lubbock and Austin are both cities in the state of Texas." \*\*\*

4. Given the following exchange rates, answer the questions posed. You must show all work and units!

$$1 \text{ USD} = 90 \text{ JPY}$$

$$8 \text{ HKD} = 1 \text{ USD}$$

- a. How many JPY equal 300 USD? Convert 50 USD to HKD. (3.5 pts each)

$$300 \text{ USD} \times 90 \text{ JPY}/1 \text{ USD} = 27,000 \text{ JPY} \text{ and } 50 \text{ USD} \times 8 \text{ HKD}/1 \text{ USD} = 400 \text{ HKD}$$

$$\text{So, } 300 \text{ USD} = 27,000 \text{ JPY} \text{ and } 50 \text{ USD} = 400 \text{ HKD}$$

- b. What is 40 HKD equal to in JPY? (8 pts)

40 HKD x 1 USD/8 HKD = 5 USD. So, 5 USD x 90 JPY/ 1USD = 450 JPY  
Thus, 40 HKD = 480 JPY

- c. Suppose you convert 10,000 of your USD to HKD for investment purposes. Assume that six months later the value of the USD is unaltered, but the exchange rate for HKD to USD has changed to 10 HKD = 1 USD. Have you gained or lost money with this investment?

**No computation is needed here. However, you MUST support your answer with a written explanation. (5 pts)**

You should have kept your USD. The HKD LOST value in relation to the USD.  
Hence, you have lost money by investing in the HKD.

5. Suppose you are performing a book search at a library. You know the title of the book is "American Political Thought" and that there are two authors. The names of the authors are "Kenneth Dolbeare" and "Michael Cummings". Determine if the book will appear in the following searches. (The library DOES have the book in its database.) Briefly explain why your answer is correct. You may want to appeal to the truth tables for each operator in the explanation. (20 pts)

- i. Dolbeare **XOR** Cummings

No, the book will not appear. XOR is not true if both of its arguments are true. Since both Dolbeare as well as Cummings appear as authors, the book will be excluded by the search system.

- ii. Kenneth **AND** Political

Yes, the book will appear. The AND operator is true only when both of its arguments are true. Since both Kenneth and Political appear in the book information, this search will return the book.

- iii. Cummings **OR** France

Yes, the book will appear. France is not in the book information, but since this is an OR statement, it is true if AT LEAST ONE of its arguments is true. Since Cummings appears in the book information, this search will return the book.

- iv. Thought **AND** (Cummings **AND NOT** France)

Yes, the book will appear. Since France is not in the book information, the statement inside the parentheses is true. Since Thought appears in the book information, the outer AND is true and so the search will return the book.