MATH 320
Final Exam
December 15, 1994

Name _____

Show **all** work. Be neat, clear and complete.

(8) 1. (a) Convert $\frac{5}{7}$ to a decimal.

(8) (b) Convert $.5\overline{67}$ to a fraction.

(8) (c) Write 234.789 in expanded place-value notation.

(5) (d) What is an irrational number?

(5) (e) Give an example of an irrational number?

(8) (f) Set up a proportion and solve: If it takes 24 pounds of flour to make bread feeding 100 people, how many people will 60 pounds of flour feed?

2. Find the area:

(8) (a)

(8) (b)

(8) (c)

(8) (d)

(8) (e)

(8) 3. (a) State the set **definition** of addition of whole numbers.

(6) (b) Use part (a) to show that $4 + 3 = 7$.

(8) 4. (a) Add:

$$\begin{array}{r} 2434_{\text{five}} \\ +\ \underline{4342_{\text{five}}} \end{array}$$

(8) (b) Multiply:

$$\begin{array}{r} 111_{\text{two}} \\ \times\ \underline{111_{\text{two}}} \end{array}$$

(8) (c) Subtract:

$$\begin{array}{r} T243_{\text{twelve}} \\ -\ \underline{9E87_{\text{twelve}}} \end{array}$$

5. State the law or laws that is/are illustrated by each of the following:

(8) (a) $xy + z = yx + z$

(8) (b) $(y + z)(x + w) = (y + z) \cdot x + (y + z) \cdot w$

(8) (c) $2 + (x(y + w)) \cdot z = 2 + x((y + w) \cdot z)$

(8) (d) $0 + (1 \cdot 2) = 2$

6. State whether each of the following sets is closed under the given operation. Explain **and** justify your answer.

(6) (a) $\{0, {}^{-}2, {}^{-}4, {}^{-}6, {}^{-}8, \ldots\}$ under subtraction

(6) (b) $\{1, 2, 4, 8, 16, 32, \ldots\}$ under multiplication

(12) 7. State two **different** important properties that the set, Q, of rational numbers has that the set, W, of whole numbers doesn't have.

8. Which is greater? Show your work!

(8) (a) $\dfrac{23}{39}$ or $\dfrac{25}{42}$

(8) (b) ${}^{-}2 \cdot ({}^{-}3 + 5)$ or $2 - ({}^{-}3 \cdot {}^{-}3)$.

(8) 9. John lives 11 miles north of the town center and Mary lives 8 miles east of the town center. How far apart (straight-line distance) does John live from Mary?