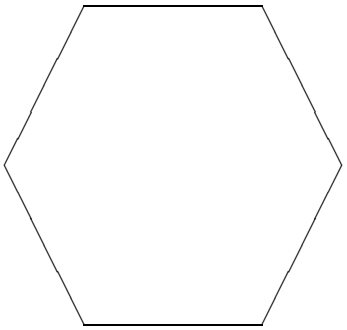
Math 310 - Dr. Miller - Final Exam - 4/29/09

1. *[5 pts]* Explain which part of a fraction cannot be zero, referring to one of the "part of" meanings of a fraction.

2. *[8 pts]* If the hexagon below represents the fraction 3/5, draw a figure that represents the fraction 1/2. Clearly indicate your answer, but you need not explain.



3. *[5 pts]* Find a fraction that is equivalent to $\frac{286}{260}$ but whose numerator is between 445 and 475. Show clear work.

4. *[5 pts]* Which is larger, 50/61 or 5/6? Justify your answer.

5. *[4 pts]* Subtract entirely in mixed number notation: $8\frac{1}{3} - 3\frac{5}{7}$.

6. *[8 pts]* Draw a diagram representing $5 \div \frac{3}{4}$ as a division problem. Clearly explain how your diagram shows the entire answer, including any "remainder."

7. *[6 pts - 2 each]* Write the complete name (for instance, "_____ Property of Multiplication") of the property best illustrated in each number sentence below. Spell correctly.

   (a) $3 \cdot (\frac{1}{2} + \frac{2}{3}) + (4 \cdot \frac{1}{5}) \cdot \frac{5}{6} = 3 \cdot (\frac{1}{2} + \frac{2}{3}) + 4 \cdot (\frac{1}{5} \cdot \frac{5}{6})$

   (b) $3 \cdot (\frac{1}{2} + \frac{2}{3}) + (4 \cdot \frac{1}{5}) \cdot \frac{5}{6} = 0 + 3 \cdot (\frac{1}{2} + \frac{2}{3}) + (4 \cdot \frac{1}{5}) \cdot \frac{5}{6}$

   (c) $3 \cdot (\frac{1}{2} + \frac{2}{3}) + (4 \cdot \frac{1}{5}) \cdot \frac{5}{6} = (\frac{1}{2} + \frac{2}{3}) \cdot 3 + (4 \cdot \frac{1}{5}) \cdot \frac{5}{6}$

8. *[8 pts]* The recipe for tropical party punch calls for 2 parts 7-Up, 1 part pineapple juice, 1/2 part coconut milk, and 1/4 part cherry extract. If you want to make $22\frac{1}{2}$ gallons of the punch altogether, how many gallons of cherry extract do you need? Show clear work.

9. *[6 pts]* Find two different decimal numbers that each satisfy all of the following clues:

   - The digit in the 10^0 position equals the digit in the 10^{-2} position.
   - Rounded to the nearest ten, the number is 40.
   - The digit in the tenths position is 8 less than that in the ones position.

10. *[8 pts]* Divide by hand, then explain thoroughly why the decimal point in the dividend is moved as it is: $0.07 \div 0.35$.

11. *[14 pts - 3 or 5 each]* Convert as indicated; if not possible, say so.

    (a) $1.45\overline{7}$ to a fraction

    (b) $1.45\overline{7}$ to a percent, rounded to the nearest tenth of a percent

    (c) 6.83% to a fraction

    (d) $\frac{7}{18}$ to a decimal; do not round

12. *[5 pts]* Create an irrational number that is between $\frac{28}{33}$ and $0.\overline{848}$.

13. *[6 pts]* Robert's retirement was worth \$117,750 last year. This year, it is only worth \$98,920. By what percent did it decrease? Round to the nearest tenth of a percent.

14. *[6 pts]* Kelly paid \$45.78 for a dress marked 20% off. What was the original price of the dress?

15. *[6 pts - 2 each]* Circle the best type of statistical graph for displaying each type of information below.

(a) The average temperature each day of the past month

circle graph line graph bar graph

(b) The number of residents in each age bracket at a city apartment complex

histogram stem-and-leaf plot line graph

(c) The number of children who like certain flavors of ice cream

circle graph pictograph box-and-whisker plot

16. *[8 pts - 4 each]* Create your own set of five scores from 0 to 100 (inclusive) satisfying each set of conditions below. If not possible, explain why in 1-2 sentences.

(a) The mean is 60 and the median is 80.

(b) There are two modes and the median is 40.

17. *[4 pts]* Find the upper quartile for these scores: 54, 47, 98, 76, 67, 65, 55, 87, 90, 65, 82, 84, 73.

18. *[10 pts - 2 or 4 each]* An experiment consists of spinning a spinner marked 3, 5, 6 in equal sections and then rolling an ordinary die.

    (a) List the members of a uniform sample space for this experiment.

    (b) What is the probability that the number on the die is at least as large as the number on the spinner?

    (c) What is the probability that the sum is 8 and you got a two or three on one of the objects?

    (d) What is the probability that the sum is 8 given that you got a two or three on one of the objects?

19. *[5 pts]* Draw a spinner that simultaneously satisfies all these conditions:

    - The probability of landing on red, yellow, blue, green, or white is 1.
    - The probability of landing on a color in the American flag is 1/2.
    - The probability of landing on yellow is twice that of landing on green.
    - At least one color has a probability of 0.

20. *[5 pts]* Forty-eight employees at Hudson Inc have a mean age of 46.2 years. Six retire; these six have a mean age of 62.1 years. What is the mean age of the remaining employees, to the nearest tenth? Show clear work.

21. *[6 pts - 3 each]* A security code consists of three digits followed by two letters.

    (a) How many codes do not use the letter Z and do not repeat digits or letters?

    (b) How many codes have all three digits the same and do not repeat letters?

22. *[8 pts - 2 each]* Circle the most reasonable measurement:

    (a) The temperature outdoors on a nice summer day:

    85^o C 15^o C 35^o C 105^o C

    (b) The distance from here to Pittsburgh:

    50 km 100 km 5 km 1000 km

    (c) The weight of a typical pen or pencil:

    2.5 mg 2.5 kg 25 mg 25 g

    (d) The volume of your bathtub:

    120 ℓ 1.2 ℓ 120 mℓ 1.2 kℓ

23. *[4 pts]* Convert: 58.2 dm = _____ hm