

Exam 3 – Part 1 – Wednesday, Apr. 6, 2005.
Math 320: Math for Elementary School Teachers
20–MINUTES MENTAL DRILL

INSTRUCTIONS: ONLY WRITE THE FINAL ANSWER, NO SCRATCH PAPER, NO SCRIBBLING ON THIS SHEET, NO CALCULATORS, USE INK PEN ONLY. EXERCISE THE COMPUTATIONAL TRICKS (THINKING STRATEGIES) WE HAVE BEEN LEARNING. EACH QUESTION IS WORTH 2 POINTS.

1. Is 2838 a multiple of 4? YES NO

2. Factor 140 =

3. $\frac{1-\frac{1}{3}}{1+\frac{1}{2}} =$

4. Find N where $57 < N < \frac{3845}{53}$

5. $\text{GCF}(110, 130) =$

6. Average $\frac{2}{5}, \frac{3}{10}, \frac{6}{15}$

7. $\text{LCM}(2 \cdot 3 \cdot 7, 5) =$

8. $10 \cdot \frac{2}{3} + 5 \cdot \frac{5}{3} =$

9. 44 times “24 and 1 eleventh” =

10. Three fourths divided by four fifths =

NAME _____

EXAM 3 – Part 2 – Wednesday, Apr. 6, 2005.
Math 320: Math for Elementary School Teachers
PART 2: 30–MINUTES TEST

INSTRUCTIONS: USE SCRATCH PAPER, WRITE COMPLETE AND FINAL ANSWERS USING INK PEN, NO SCRIBBLING, NO CALCULATORS. PARTIAL CREDIT WILL BE GIVEN IF DESERVED, SO JUSTIFY AND SHOW ALL YOUR WORK.

1. (5pts) Fill in the blanks:

(a) An even number is _____

and an odd number is _____.

(b) A is divisible by k whenever A is a _____ of k ,

or k is a _____ of A .

(c) Fundamental Theorem of Arithmetics: Every whole number $N > 1$

(d) The numerator of a fraction is the number of _____.

_____.

(e) Give the interpretive question for $13/4 \div \frac{1}{2}$ in partitive division:

_____.

2. (5pts) Give a “picture proof” and an “algebra proof” of the fact that if you subtract a smaller even number from an odd number the result is still odd.

3. (6pts) Give a full “teacher’s solution” for the following two word problems. Use both a bar diagram and pre-algebra, and finally show the arithmetic calculations.

“ $\frac{3}{8}$ of a group of children are boys. There are 30 more girls than boys. How many children are there altogether?”

“Jane used $\frac{1}{3}$ of the flour to bake some cookies and $\frac{1}{6}$ of the rest to bake some cake. If she has 10 cups of flour left, how much flour did she start with?”

4. **(3pts)** Give an algebra proof of the fact that a 3-digit number $(abc)_{10}$ is divisible by 9 if $a + b + c$ is. Hint: use the place value expansion of $(abc)_{10}$.

5. **(2pts)** Illustrate how to multiply $\frac{4}{5} \times \frac{2}{3}$ using an area model.

6. (4pts) Estimate the square root of 143 and use the primality test to check if 143 is prime.

7. (5 pts) Compute the expression below using the arithmetic properties to your advantage. Write all the steps you have taken and show the strategies you have used.

$$\left(\frac{1}{4} - \frac{9}{25} \times \frac{5}{18}\right)^2 \div \left(1 + \frac{1}{2}\right)^2 - \left(\frac{1}{10}\right)^2 =$$