

**Show all your work! Full credit is based on work shown!**

9pts

1. **Without actually dividing**, use divisibility tests to determine if 85,932 is divisible by each of the following numbers.

a. Does  $9 \mid 85,932$ ? \_\_\_\_\_ Show the **divisibility test for 9**:

b. Does  $7 \mid 85,932$ ? \_\_\_\_\_ Show the **divisibility test for 4**:

c. Does  $11 \mid 85,932$ ? \_\_\_\_\_ Show the **divisibility test for 11**:

5pts

2. Complete the following five digit number so that it is divisible by 6. Give all possible answers; show the divisibility test for 6.

53,43\_\_

13pts

3. a. The **prime factorization** of 132 is \_\_\_\_\_.

c. Draw a Venn Diagram to show how the prime factors of 132 and 165 are related.

b. The **prime factorization** of 165 is \_\_\_\_\_.

Show your factor trees here:

d. The GCF (132, 165) = \_\_\_\_\_.

e. The LCM (132, 165) = \_\_\_\_\_

6pts.

4. Show all your steps in the following addition problem, using the LCM from problem 3e & simplify your answer, if possible.

$$\frac{7}{132} + \frac{13}{165} =$$

3pts

5. Is 103 a prime number? \_\_\_\_\_ Explain, using the definition of a prime number and divisibility tests:

6pts

6. Rewrite each of the following with a single exponent. Include your work to show the rules of exponents that you used.

a.  $(7^5 \cdot 7^3) =$

b.  $\frac{6^7}{6^3} =$

c.  $6^3 4^2 3^4 =$

3pts

7. Mentally determine which is larger  $9^{11}$  or  $3^{20}$ ? \_\_\_\_\_ Justify your answer using the rules of exponents.

3pts

8. Is the set of whole number multiples of three  $\{0, 3, 6, 9, 12, 15, 18, 21, \dots\}$  **closed** for division? \_\_\_\_\_ Explain:

6pts

9. Name three **properties for addition** of whole numbers and give an example for each one.

6pts

10. Illustrate that  $4 \times 2 = 8$ , using the following:

a. **number line**

b. **set model**

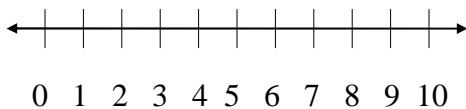


6pts

11. Illustrate that  $8 - 5 = 3$ , using:

a. **number line**

b. **set model**



6pts

12. Fill in the blanks using the definition of division, **writing each division equation as a multiplication equation**. (If there is no valid answer put “undefined” and show why.)

- a.  $35 \div 7 = \underline{\hspace{2cm}}$  because  $\underline{\hspace{1cm}} \times \underline{\hspace{1cm}} = 35$
- b.  $0 \div 12 = \underline{\hspace{2cm}}$  because  $\underline{\hspace{2cm}}$
- c.  $0 \div 0 = \underline{\hspace{2cm}}$  because  $\underline{\hspace{2cm}}$

2pts

13. Fill in the blank using the **definition of “less than”**:  $7 < 12$  because  $\underline{\hspace{2cm}}$ .

6pts

14. Write out the steps to show an easy way to **mentally calculate** each of the following:  
Give the exact answer, not an estimate and do not use standard paper and pencil methods.

- a.  $25 \times 19 - 25 \times 11$
- b. 
$$\begin{array}{r} 557 \\ + 395 \\ \hline \end{array}$$

4pts

15. a. **Estimate** using compatible numbers.                      b. **Estimate** using the range method.

$3426 \div 49$

$$\begin{array}{r} 2625 \\ 420 \\ + 3376 \\ \hline \end{array}$$

5pts

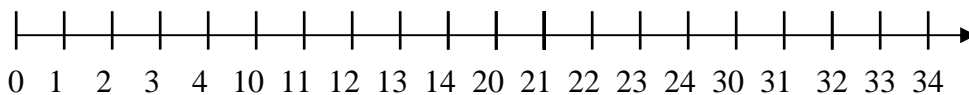
16. Rosa wants to make a game board that is 16 inches by 24 inches for a game she has invented. She will use square tiles. What are the dimensions of the **largest tile** Rosa can use?  $\underline{\hspace{2cm}}$   
[Answer this showing all your work & list your problem solving strategies.]

11pts

17. Do each of the following problems in **base five arithmetic**:

**Show your work on this number line to illustrate how to determine the necessary number facts.**

**Subtraction facts**



**multiples of 3**

**multiples of 4**

a. Subtract in **base five**:

$$\begin{array}{r} 402 \\ - 234 \\ \hline \end{array}$$

b. Multiply:  $321 \times 43$  in **base five**:  
using lattice multiplication.

