MDE 010, Homework #2, Summer 2023 Name _____

Instructions: Record your answers to each of these problems directly on this page. Do the work on a separate page and attach these pages to this one. You should do the work by hand, but you may check your work with a calculator.

1. Place the following numbers on the number line.

$$\left\{4, -3, \sqrt{2}, -\pi, \frac{2}{3}, \frac{8}{7}, -1.18, 0\right\}$$

2. State the opposite of the numbers in problem #1.

3. Add $15 + (-2) + 7 + 14 + (-5) + (-12)$

4. Add $-1271 + (-|-13|)$

5. Simplify $-3 - (-5) - 9 + 4 - (-6)$

6. Subtract $-93 - (-84) - 41 - (-56)$

7. Simplify $(-2)^3 \cdot (-3)^2$

8. Multiply $(-5)6(-4)5$

9. Simplify $(-1)^{12}$

10. Simplify $\dfrac{38-178}{5+30}$

11. Simplify $(-2) \cdot |3 - 2^2| + 5$

12. Simplify $785 - \dfrac{285-54}{17+3\cdot 51}$

13. Simplify $\dfrac{2\cdot 3^2 \div \left(3^2 - (2+1)\right)}{5^5 - 6^2 - 2^2(-3)}$

14. List the first 10 multiples of 13.

15. Determine whether 78 is divisible by 6.

16. Evaluate 7^3.

17. List all the factors of 72.

18. State whether each of the following numbers are prime or composite:
    a) 91 b) 23 c) 85 d) 1 e) 89

19. List the prime factors of 7000.

20. Insert =, < or > to define the relationship between the following pairs of fractions:
    a) $\frac{3}{4} \_\_ \frac{9}{12}$ b) $\frac{5}{-2} \_\_ \frac{-17}{7}$ c) $\frac{2}{5} \_\_ \frac{3}{7}$ d) $\frac{425}{165} \_\_ \frac{130}{66}$

21. Divide and simplify to lowest terms.
    a) $\frac{4}{3} \div \frac{1}{3}$ b) $\frac{-15}{28} \div \frac{-9}{20}$ c) $\frac{77}{64} \div \frac{49}{18}$ d) $\frac{\frac{5}{6}}{\frac{2}{7}}$ e) $\frac{-\frac{35}{18}}{-\frac{14}{27}}$

22. Find the least common multiple of the following sets of numbers:
    a) 5, 10 b) 21, 27 c) 3, 6, 15 d) 12, 18, 30

23. Add and simplify the following:
    a) $\frac{4}{9} + \frac{1}{9}$ b) $\frac{7}{12} + \frac{-5}{12}$ c) $\frac{7}{12} + \frac{3}{8}$ e) $\frac{3}{20} + 4$

24. Evaluate and simplify to lowest terms. $-8 \div \frac{1}{2} + \frac{3}{4} + \left(-5 - \frac{5}{8}\right)^2$

25. Simplify fractions (writing fractions in ***lowest terms*** or ***reducing***)
    a. Write $\frac{6}{10}$ in lowest terms b. Reduce $\frac{30}{36}$ c. Simplify $\frac{48}{72}$

26. Build equivalent fraction in ***higher terms*** (unreducing)
    a. $\frac{1}{2}$ is equivalent to $\frac{?}{4}$ c. $\frac{1}{3}$ is equivalent to $\frac{?}{12}$
    b. $\frac{5}{8} \equiv \frac{?}{72}$ d. $\frac{7}{12} \equiv \frac{?}{48}$

27. Adding/subtracting fraction and mixed numbers (same denominators)
    a. $\frac{1}{5} + \frac{3}{5} + \frac{2}{5} \rightarrow$ b. $\frac{7}{18} - \frac{5}{18} \rightarrow$

28. Find an LCD (LCM)
    a. $\frac{5}{6} + \frac{5}{8} + \frac{1}{12}$ c. $\frac{2}{5} + \frac{3}{10} + \frac{7}{15}$
    b. $\frac{5}{48} + \frac{7}{40} + \frac{1}{14}$ d. $\frac{5}{12} - \frac{1}{15}$

29. Adding/subtracting fractions with ***different*** denominators
    a. $\frac{5}{6}+\frac{5}{8}+\frac{1}{12}\rightarrow$
    b. $\frac{5}{48}+\frac{7}{40}+\frac{1}{14}\rightarrow$
    c. $\frac{2}{5}+\frac{3}{10}+\frac{7}{15}\rightarrow$
    d. $\frac{5}{12}-\frac{1}{15}\rightarrow$

30. Multiply and divide fractions.
    a. $\frac{5}{7}\times\frac{3}{10}\rightarrow$
    b. $\frac{5}{12}\div\frac{3}{4}$
    c. $6\times\frac{1}{4}\rightarrow$
    d. $16\div\frac{2}{3}$

31. Compute the following expressions.
    a. $5-(-8)=$
    b. $(-8)\div(-4)=$
    c. $(-24)+43=$
    a. $6^6\times 2(3-7^{-2})=$
    b. $(45\times 10^3)-(63\times 10^{-3})=$
    c. $15(2^2-10)+(3^{-3}+9)-18+2=$

32. Write your answers using exponents.
    a. $100^{-4}\div 100^2=$
    b. $7\times 7\times 7\times 7\times 7\times 8\times 8\times 8\times 8\times 9\times 9\times 9\times 6\times 6\times 5=$

33. For each of the following sets of numbers, find: i) the greatest common factor (GCF), ii) the least common multiple (LCM).
    a. 18 and 24
    b. 81 and 108
    c. 123 and 59
    d. 36, 90, 336
    e. 18, 27, 72

34. Simplify the following problems:
    a. $5(2+7^2)+6^3+25(4-3)+2^2-17+5=$
    b. $4\times 6-4\div 2+(17-9)\times 2(14+8-2)\times 10\div 5=$
    c. $3-(-2)+(-4)+15-7+(-25)-(-35)+14-2(3+6)+5(-3+6)=$

35. Compute the following problems without a calculator.
    a. $\frac{2}{3}+\frac{4}{5}=$
    b. $\frac{4}{5}\times\frac{7}{8}=$
    c. $\frac{1}{3}-\frac{1}{6}=$
    d. $\frac{4}{5}\div\frac{2}{3}=$