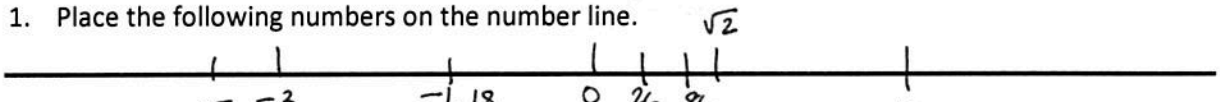
MDE 010, Homework #2, Summer 2023 Name KEY

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

3. Add $15 + (-2) + 7 + 14 + (-5) + (-12)$ 17

4. Add $-1271 + (-|-13|)$ -1284

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

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

7. Simplify $(-2)^3 \cdot (-3)^2$ -72

8. Multiply $(-5)6(-4)5$ 600

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

10. Simplify $\dfrac{38-178}{5+30}$ $-140/35 = -4$

11. Simplify $(-2)\cdot|3-2^2| + 5$ $= -2|3-4| + 5 = -2|-1| + 5 = -2(1) + 5 = -2 + 5 = 3$

12. Simplify $785 - \dfrac{285-54}{17+3\cdot 51}$ $785 - \frac{231}{170} = \frac{133219}{170} = 783\frac{109}{170}$

13. Simplify $\dfrac{2\cdot 3^2 \div \left(3^2 - (2+1)\right)}{5^5 - 6^2 - 2^2(-3)}$ $= \dfrac{18 \div (9-3)}{3101} = \dfrac{3}{3101}$

14. List the first 10 multiples of 13. 13, 26, 39, 52, 65, 78, 91, 104, 117, 130

15. Determine whether 78 is divisible by 6. it is

16. Evaluate 7^3. 343

17. List all the factors of 72. 1, 72, 2, 36, 3, 24, 4, 18, 6, 12, 8, 9

18. State whether each of the following numbers are prime or composite:

a) 91	b) 23	c) 85	d) 1	e) 89
prime	prime	Composite	neither	prime

19. List the prime factors of 7000. $7, 2^3, 5^3$

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. → 35/12

a) $\frac{4}{3} \div \frac{1}{3}$ 4 b) $\frac{-15}{28} \div \frac{-9}{20}$ $\frac{25}{21}$ c) $\frac{77}{64} \div \frac{49}{18}$ 99/224 d) $\frac{\frac{5}{6}}{\frac{2}{7}}$ e) $\frac{-\frac{35}{18}}{-\frac{14}{27}}$ 15/4

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
10	189	30	180

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) $\frac{3}{20} + 4$ $\frac{83}{20}$

5/9 1/6 23/24

24. Evaluate and simplify to lowest terms. $-8 \div \frac{1}{2} + \frac{3}{4} + \left(-5 - \frac{5}{8}\right)^2 = -16 + \frac{3}{4} + \left(-\frac{45}{8}\right)^2 = -\frac{61}{4} + \frac{2025}{64} = \frac{1049}{64}$

25. Simplify fractions (writing fractions in ***lowest terms*** or ***reducing***)

a. Write $\frac{6}{10}$ in lowest terms $\frac{3}{5}$ b. Reduce $\frac{30}{36}$ $\frac{5}{6}$ c. Simplify $\frac{48}{72}$ $\frac{4}{7}$

26. Build equivalent fraction in ***higher terms*** (unreducing)

a. $\frac{1}{2}$ is equivalent to $\frac{?}{4}$ $\frac{2}{4}$

b. $\frac{5}{8} \equiv \frac{?}{72}$ $\frac{45}{72}$

c. $\frac{1}{3}$ is equivalent to $\frac{?}{12}$ $\frac{4}{12}$

d. $\frac{7}{12} \equiv \frac{?}{48}$ $\frac{28}{48}$

27. Adding/subtracting fraction and mixed numbers (same denominators)

a. $\frac{1}{5} + \frac{3}{5} + \frac{2}{5} \rightarrow$ $\frac{6}{5}$

b. $\frac{7}{18} - \frac{5}{18} \rightarrow$ $\frac{2}{18} = \frac{1}{9}$

28. Find an LCD (LCM)

a. $\frac{5}{6} + \frac{5}{8} + \frac{1}{12}$ 24

b. $\frac{5}{48} + \frac{7}{40} + \frac{1}{14}$ 1680

4·12 4·10 2·7
4·4·3 4·2·5
2·2·2·2·3 2·2·2·5

c. $\frac{2}{5} + \frac{3}{10} + \frac{7}{15}$ 30

d. $\frac{5}{12} - \frac{1}{15}$ 60

29. Adding/subtracting fractions with ***different*** denominators

a. $\frac{5}{6}+\frac{5}{8}+\frac{1}{12}\rightarrow$ $\frac{37}{24}$

b. $\frac{5}{48}+\frac{7}{40}+\frac{1}{14}\rightarrow$ $\frac{589}{1680}$

c. $\frac{2}{5}+\frac{3}{10}+\frac{7}{15}\rightarrow$ $\frac{7}{6}$

d. $\frac{5}{12}-\frac{1}{15}\rightarrow$ $\frac{7}{20}$

30. Multiply and divide fractions.

a. $\frac{5}{7}\times\frac{3}{10}\rightarrow$ $\frac{3}{14}$

b. $\frac{5}{12}\div\frac{3}{4}$ $= 5/9$

c. $6\times\frac{1}{4}\rightarrow$ $\frac{3}{2}$

d. $16\div\frac{2}{3}$ $= 24$

31. Compute the following expressions.

a. $5-(-8)=$ 13

b. $(-8)\div(-4)=$ 2

c. $(-24)+43=$ 19

a. $6^6\times 2(3-7^{-2})=$ $46656 \times 2\left(\frac{146}{49}\right) = \frac{13623552}{49}$

b. $(45\times 10^3)-(63\times 10^{-3})=$ 44999.937

c. $15(2^2-10)+(3^{-3}+9)-18+2=$ $15(-6)+(\frac{1}{27}+9)-18+2 = -90+\frac{244}{27}-18+2 = -106+\frac{244}{27} = \frac{-2618}{27}$

32. Write your answers using exponents.

a. $100^{-4}\div 100^2=$ 10^{-12}

b. $7\times 7\times 7\times 7\times 7\times 8\times 8\times 8\times 8\times 9\times 9\times 9\times 6\times 6\times 5=$

$7^5 \cdot 8^4 \cdot 9^3 \cdot 6^2 \cdot 5$

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 GCF = 6 LCM = 72

b. 81 and 108 GGF = 27 LCM = 324

c. 123 and 59 GCF = 1 LCM = 7257

d. 36, 90, 336 GCF = 6 LCM = 15120

e. 18, 27, 72 GCF = 9 LCM = 216

34. Simplify the following problems:

a. $5(2+7^2)+6^3+25(4-3)+2^2-17+5=$ $5(51)+216+25(1)+4-17+5=$ 488

b. $4\times 6-4\div 2+(17-9)\times 2(14+8-2)\times 10\div 5=$ 662

c. $3-(-2)+(-4)+15-7+(-25)-(-35)+14-2(3+6)+5(-3+6)=$ 30

35. Compute the following problems without a calculator.

a. $\frac{2}{3}+\frac{4}{5}=$ $22/15$

b. $\frac{4}{5}\times\frac{7}{8}=$ $7/10$

c. $\frac{1}{3}-\frac{1}{6}=$ $1/6$

d. $\frac{4}{5}\div\frac{2}{3}=$ $6/5$