

Name: \_\_\_\_\_

**MATH 101**

**Summer 2022**

**HW 1: Due 05/24**

*"It is easy to forget now, how effervescent and free we all felt that summer."*

*–Anna Godbersen*

**Problem 1.** (10pt) Showing all your work and simplifying as much as possible, compute each of the following:

(a)  $15/5(1 + 2)$

(b)  $20/(4(2 + 3))$

(c)  $\frac{4^2/2 - 8 + 3 \cdot -2}{(12 - 4)(4 - 5)}$

(d)  $\frac{8 - 12}{-2^2} + 7 \cdot 12/2$

(e)  $4(-1)^3 - 2(-1)^3 + 6 \cdot 5/4$

**Problem 2.** (10pt) Showing all your work, find the prime factorizations of the following integers:

(a) 90

(b) 141

(c) 149

(d) 27

(e) 185

**Problem 3.** (10pt) Compute each of the following by finding the divisors/multiples of the given integers:

(a)  $\gcd(18, 24)$

(b)  $\gcd(60, 125)$

(c)  $\text{lcm}(14, 20)$

(d)  $\text{lcm}(10, 21)$

**Problem 4.** (10pt) Use the prime factorizations of the given integers to compute each of the following:

(a)  $\gcd(142, 200)$

(b)  $\text{lcm}(72, 204)$

(c)  $\gcd(2^{11} \cdot 3^8 \cdot 7^2 \cdot 17^4, 2^5 \cdot 3^2 \cdot 5^6 \cdot 11^{30})$

(d)  $\text{lcm}(2^{11} \cdot 3^8 \cdot 7^2 \cdot 17^4, 2^5 \cdot 3^2 \cdot 5^6 \cdot 11^{30})$

**Problem 5.** (10pt) For each of the following, either convert the rational number from an improper fraction to a proper fraction or vice versa:

(a)  $5\frac{6}{7}$

(b)  $\frac{35}{3}$

(c)  $-9\frac{3}{4}$

(d)  $-\frac{26}{5}$

**Problem 6.** (10pt) Completely reduce the following rational numbers, showing all your work:

(a)  $\frac{15}{33}$

(b)  $-\frac{140}{90}$

(c)  $\frac{210}{308}$

(d)  $\frac{10}{21}$

**Problem 7.** (10pt) Simplifying as much as possible and showing all your work, compute the following:

(a)  $\frac{12}{15} - \frac{5}{9}$

(b)  $\frac{1}{6} + \frac{7}{12}$

(c)  $-\frac{5}{12} + \frac{7}{18}$

(d)  $2 + \frac{1}{3} - \frac{5}{2}$

**Problem 8.** (10pt) Simplifying as much as possible and showing all your work, compute the following:

(a)  $\frac{15}{14} \cdot \frac{7}{33}$

(b)  $\frac{\frac{5}{6}}{\frac{7}{15}}$

(c)  $\frac{19}{4} \cdot -\frac{10}{9}$

(d)  $\frac{\frac{2}{45}}{\frac{20}{21}}$



**Problem 9.** (10pt) Showing all your work, convert the following rational numbers to decimals:

(a)  $\frac{4}{9}$

(b)  $\frac{7}{20}$

(c)  $\frac{2}{11}$

**Problem 10.** (10pt) Showing all your work, convert the following decimals to rational numbers:

(a) 0.7

(b) 0.125

(c)  $0.121212\overline{12}$