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

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

(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) $\mathrm{lcm}(14, 20)$

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

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) $\gcd(2^1 1 \cdot 3^8 \cdot 7^2 \cdot 17^4, 2^5 \cdot 3^2 \cdot 5^6 \cdot 11^{30})$

(d) $\text{lcm}(2^1 1 \cdot 3^8 \cdot 7^2 \cdot 17^4, 2^5 \cdot 3^2 \cdot 5^6 \cdot 11^{30})$

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) $\dfrac{15}{33}$

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

  (a) 0.7

  (b) 0.125

  (c) $0.121212\overline{12}$