## ASSIGNMENT 1

## DYLAN ZWICK'S MATH 1010 CLASS

## 1. Section 1.1 - The Real Number System

Determing which of the real numbers in the set are:
(1) natural numbers,
(2) integers,
(3) rational numbers,
(4) irrational numbers.
1.1.1: $-\left\{-6,-\sqrt{6},-\frac{4}{3}, 0, \frac{5}{8}, \sqrt{2}, 2, \pi, 6\right\}$.
1.1.3: - $\left\{-4.2, \sqrt{4},-\frac{1}{9}, 0, \frac{3}{11}, \sqrt{11}, 5 . \overline{5}, 5.543\right\}$.

For the next two problems use an overbar symbol to rewrite the decimal using the smallest number of digits possible.
1.1.7: - $2.121212 \ldots$
1.1.8: - $0.436436436 \ldots$
1.1.11: - List all odd integers between $\pi$ and 10 .
1.1.13: Plot the real numbers in the set $\left\{3, \frac{5}{2},-\frac{7}{2},-5.2\right\}$ on the real number line.

In the following exercises, place the correct inequality symbol between the pair of numbers.
1.1.19: $\frac{4}{5} \quad 1$
1.1.22: $9-1$
1.1.23: $-5-2$
1.1.26: $\frac{3}{2} \quad \frac{5}{2}$

In the following exercises, find the distance between the pair of real numbers.
1.1.29: 4 and 10
1.1.32: -54 and 32
1.1.33: 18 and -32
1.1.36: 0 and 125
1.1.39: -6 and -9
1.1.40: -12 and -7

In the following exercises, evaluate the given expression.
1.1.42: |62|
1.1.43: $|-225|$
1.1.48: $-|-25|$
1.1.51: $-|3.5|$
1.1.53: $|-\pi|$
1.1.54: $-|\pi|$

In the following exercises, place the correct symbol $(<,>$, or $=)$ between the pair of real numbers.
1.1.55: $|-6|$
1.1.58: $|150| \quad|-310|$
1.1.59: $|-1.8| \quad|1.8|$
1.1.62: $-\left|-\frac{7}{3}\right| \quad-\left|\frac{1}{3}\right|$

In the following exercises, write the statement using inequality notation.
1.1.83: $x$ is negative.
1.1.85: $u$ is at least 16.
1.1.91: Find the two possible values of $a$ given $|a|=4$.
2. Section 1.2 - Operations with Real Numbers Evaluate the expressions.
1.2.1: $13+32$
1.2.2: $16+84$
1.2.4: $-5+9$
1.2.6: $-5.1+0.9$
1.2.9: $12.6+(-38.5)$
1.2.12: $-3-17$
1.2.15: $4-(-11)+9$
1.2.17: $5.3-2.2-6.9$
1.2.20: $6+26-17+(-10)$
1.2.23: $\frac{3}{4}-\frac{1}{4}$
1.2.26: $\frac{6}{7}+\left(-\frac{3}{7}\right)$
1.2.31: $10 \frac{5}{8}-6 \frac{1}{4}$
1.2.35: $-(-11.325)+|34.625|$
1.2.37: $-\left|-6 \frac{7}{8}\right|-8 \frac{1}{4}$
1.2.42: Write the expression $\frac{2}{3}+\frac{2}{3}+\frac{2}{3}+\frac{2}{3}$ as a multiplication problem.

In the following exercises find the requested product.
1.2.45: 5(-6)
1.2.48: $(-4)(-7)$
1.2.51: $(-1)(12)(-3)$
1.2.54: $\left(-\frac{4}{7}\right)\left(-\frac{4}{5}\right)$
1.2.55: $-\frac{3}{2}\left(\frac{8}{5}\right)$
1.2.58: $\frac{1}{3}\left(\frac{2}{3}\right)$
1.2.61: $\frac{1}{3}\left(-\frac{3}{4}\right)(2)$

In the following exercises, find the reciprocal
1.2.63: 6
1.2.66: $\frac{9}{5}$
1.2.68: $-\frac{2}{13}$

In the following exercises, evaluate the given expression.
1.2.70: $-\frac{30}{-15}$
1.2.71: $-48 \div 16$
1.2.76: $-\frac{11}{12} \div \frac{5}{24}$
1.2.79: $-4 \frac{1}{4} \div-5 \frac{5}{8}$
1.2.81: $4 \frac{1}{8} \div 4 \frac{1}{2}$
1.2.87: Write the expression $-(7 \cdot 7 \cdot 7)$ using exponential notation.

In the following problems evaluate the given exponential expression.
1.2.91: $(-2)^{4}$
1.2.96: $\left(\frac{2}{3}\right)^{4}$

In the following exercises, evaluate the given expression.
1.2.105: $24-5 \cdot 2^{2}$
1.2.109: $14-2(8-4)$
1.2.112: $72-8\left(6^{2} \div 9\right)$
1.2.115: $5^{3}+|-14+4|$
1.2.119: $\frac{4^{2}-5}{11}-7$
1.2.121: $\frac{6 \cdot 2^{2}-12}{3^{2}+3}$
1.2.122: $\frac{7^{2}-2(11)}{5^{2}+8(-2)}$
1.2.134: Profit The midyear financial statement of a clothing company showed a profit of $\$ 1,345,298.55$. At the close of the year, the financial statement showed a profit for the year of $\$ 867,132.87$. Find the profit (or loss) of the company for the second 6 months of the year.
1.2.138: (a): You save $\$ 60$ per month for 30 years. How much money has been set aside during the 30 years?
(b): If the money in part (a) is deposited in a savings account earning $3 \%$ interest compounded monthly, the total amount in the account after 30 years wil be:

$$
60\left[\left(1+\frac{0.03}{12}\right)^{360}-1\right]\left(1+\frac{12}{0.03}\right) .
$$

Use a calculator to determine this amount.
(c): How much of the amount in part (b) is earnings from interest?
3. Section 1.3 - Properties of Real Numbers

In the following exercises identify the property of real numbers illustrated by the statement.
1.3.1: $18-18=0$
1.3.5: $13+12=12+13$
1.3.12: $1 \cdot 9 k=9 k$

In the following exercises complete the statement using the specified property of real numbers.
1.3.21: Commutative Property of Multiplication: $15(-3)=$
1.3.24: Distributive Property: $(8-y)(4)=$

In the following exercises give (a) the additive inverse and (b) the multiplicative inverse of the quantity.
1.3.33: $\frac{1}{2}$
1.3.37: $6 z, z \neq 0$
1.3.40: $y-7, y \neq 7$.

In the following exercises rewrite the expression using the Distributive Property.
1.3.45: $20(2+5)$
1.3.49: $-6(2 y-5)$
1.3.50: $-4(10-b)$
1.3.65: Identify the property of real numbers that justifies each step.

$$
\begin{gathered}
2 x-5=6 \\
(2 x-5)+5=6+5 \\
2 x+(-5+5)=11 \\
2 x+0=11 \\
2 x=11 \\
\frac{1}{2}(2 x)=\frac{1}{2}(11) \\
\left(\frac{1}{2} \cdot 2\right) x=\frac{11}{2} \\
1 \cdot x=\frac{11}{2} \\
x=\frac{11}{2}
\end{gathered}
$$

