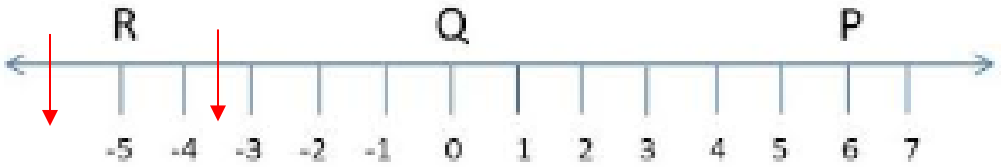
Pre-Algebra
Unit 2 Test Review **ANSWER KEY**

1. State the **absolute value**, **additive inverse** (*opposite*), and **multiplicative inverse** (*reciprocal*) of each number.

	-12	**0**	$-\frac{3}{4}$	$2\frac{4}{5}$
Absolute Value	**12**	**0**	$\frac{3}{4}$	$2\frac{4}{5}$
Additive Inverse	**12**	**0**	$\frac{3}{4}$	$-2\frac{4}{5}$
Multiplicative Inverse	$-\frac{1}{12}$	**Undefined** ***Cannot divide by 0***	$-\frac{4}{3}$	$\frac{5}{14}$

2. Consider the number line pictured below.



A. What is the distance between **R** and **P**?

6 – (-5) or |-5 – 6|
6 + 5 |-5 + (-6)|
11 units |-11| = **11 units** *Distance is always positive*

B. Point **S** is 1.5 units from **R**. Name all possible values of **S**.

-5 + 1.5 = -3.5 and -5 – 1.5 =
S = -3.5 -5 + (-1.5) = -6.5
S = -6.5

3. Express each mixed number as an **improper fraction** and each improper fraction as a **mixed number**.

a. $3\frac{5}{9}$ b. $-5\frac{3}{4}$ c. $\frac{19}{2}$ d. $-\frac{45}{11}$

$\frac{32}{9}$ $-\frac{23}{4}$ $9\frac{1}{2}$ $-4\frac{1}{11}$

4. Complete the table below with an **equivalent form** of each number.

Fraction	**Decimal**
$\frac{1}{3}$	$\mathbf{0.\overline{3}}$
$\frac{625}{1000} = \mathbf{\frac{5}{8}}$	0.625
$-\frac{2}{5}$	$\mathbf{-0.4}$
$-1\frac{5}{100} = \mathbf{-1\frac{1}{20}}$	-1.05
$\frac{23}{4}$	$5\frac{3}{4} = \mathbf{5.75}$

5. Write the decimal equivalent of each fraction <u>using long division</u>.

A. $-\frac{1}{8}$ $\mathbf{-0.125}$

$$
\begin{array}{r}
0.125 \\
8\overline{)1.000} \\
-8 \\
\hline
20 \\
-16 \\
\hline
40 \\
-40 \\
\hline
0
\end{array}
$$

B. $2\frac{5}{6}$ $\mathbf{2.8\overline{3}}$

$$
\begin{array}{r}
0.833 \\
6\overline{)5.000} \\
-48 \\
\hline
20 \\
-18 \\
\hline
20
\end{array}
$$

6. Evaluate each of the following expressions. ***All fractions must be written in simplest form.***

a) $3.5 - 8.2$ $3.5 + (-8.2)$ **-4.7** $\begin{array}{r} 7 \\ \cancel{8}.2 \\ -\ 3.5 \\ \hline 4.7 \end{array}$	b) $\cancel{\frac{2}{3}} + \frac{1}{5} + \left(-\cancel{\frac{2}{3}}\right)$ $\frac{1}{5}$ opposites = 0 $\frac{1}{5} + 0 = \frac{1}{5}$	c) $\frac{1}{3} + \frac{1}{5}$ $\frac{5}{15} + \frac{3}{15} = \frac{8}{15}$ $\frac{8}{15}$
d) $-2.8 - (-6.08)$ $-2.8 + 6.08$ **3.28** $\begin{array}{r} 5 \\ \cancel{6}.08 \\ -\ 2.80 \\ \hline 3.28 \end{array}$	e) $1.4 - (-0.8)$ $1.4 + 0.8$ **2.2** $\begin{array}{r} 1.4 \\ +\ 0.8 \\ \hline 2.2 \end{array}$	f) $-45 \div 1.5$ $-450 \div 15$ **-30** $\begin{array}{r} 30 \\ 15\overline{)450} \\ \underline{45}\downarrow \\ 00 \end{array}$
g) $\frac{5}{9} \div \frac{1}{3}$ $\frac{5}{\cancel{9}} \cdot \frac{\cancel{3}}{1}$ factor of 3 $\frac{5}{3} \cdot \frac{1}{1} = \frac{5}{3}$ $1\frac{2}{3}$	h) $(11.2)(-6.4)$ **-71.68** $\begin{array}{r} 11.2 \\ \times\ 6.4 \\ \hline 448 \\ +\ 6720 \\ \hline 7168 \end{array}$	i) $-9\frac{1}{3} - 1\frac{2}{3}$ $-9\frac{1}{3} + \left(-1\frac{2}{3}\right)$ $\frac{-28}{3} + \frac{-5}{3} = \frac{-33}{3}$ **-11**
j) $-2 \div \left(-\frac{4}{11}\right)$ $\frac{-\cancel{2}}{1} \cdot \frac{-11}{\cancel{4}}$ factor of 2 $\frac{-1}{1} \cdot \frac{-11}{2} = \frac{11}{2}$ $5\frac{1}{2}$	k) $-3\frac{1}{6} + 6\frac{1}{4}$ $\frac{-19}{6} + \frac{25}{4}$ $\frac{-38}{12} + \frac{75}{12} = \frac{37}{12}$ $3\frac{1}{12}$	l) $-3\frac{1}{3} \times 5\frac{13}{20}$ $\frac{-\cancel{10}}{3} \times \frac{113}{\cancel{20}}$ factor of 10 $\frac{-1}{3} \times \frac{113}{2} = \frac{-113}{6}$ $-18\frac{5}{6}$
m) $\frac{2}{5}\left(\frac{2}{3} - \frac{1}{4}\right)$ $\frac{2}{5}\left(\frac{8}{12} - \frac{3}{12}\right)$ $\frac{\cancel{2}}{\cancel{5}}\left(\frac{\cancel{5}}{12}\right)$ factors of 2 and 5 $\frac{1}{1}\left(\frac{1}{6}\right) = \frac{1}{6}$ $\frac{1}{6}$	n) $\frac{-\frac{9}{11}}{\frac{24}{11}}$ $-\frac{9}{11} \div \frac{24}{11}$ $\frac{-\cancel{9}}{\cancel{11}} \cdot \frac{\cancel{11}}{24}$ factors of 1 and 3 $\frac{-3}{1} \cdot \frac{1}{8} = \frac{-3}{8}$ $-\frac{3}{8}$	o) $\frac{1}{2}(0.5 + (-1.7))$ $\frac{1}{2}(-1.2)$ $0.5(-1.2)$ **-0.6** $\begin{array}{r} 1.7 \\ -\ 0.5 \\ \hline 1.2 \end{array}$ $\begin{array}{r} 1.2 \\ \times\ 0.5 \\ \hline .60 \end{array}$

7. Evaluate the following algebraic expressions when $x = \frac{4}{5}$, $y = -\frac{7}{8}$ and $z = \frac{1}{15}$

A. $2x - y$

$2\left(\frac{4}{5}\right) - \left(-\frac{7}{8}\right)$

$\frac{2}{1}\left(\frac{4}{5}\right) - \left(-\frac{7}{8}\right)$

$\frac{8}{5} - \left(-\frac{7}{8}\right)$

$\frac{8}{5} + \frac{7}{8}$

$\frac{64}{40} + \frac{35}{40} = \frac{99}{40}$

$\mathbf{2\frac{19}{40}}$

B. x^2y

$\left(\frac{4}{5}\right)^2\left(-\frac{7}{8}\right)$

$\frac{4}{5} \cdot \frac{4}{5} \cdot \frac{-7}{8}$

$\frac{\cancel{16}}{25} \cdot \frac{-7}{\cancel{8}}$ factor of 8

$\frac{2}{25} \cdot \frac{-7}{1} = \frac{-14}{25}$

$\mathbf{-\frac{14}{25}}$

C. $\frac{xy}{z}$

$\frac{\left(\frac{\cancel{4}}{5}\right)\left(-\frac{7}{\cancel{8}}\right)}{\frac{1}{15}}$ factor of 4

$\frac{\left(\frac{1}{5}\right)\left(\frac{-7}{2}\right)}{\frac{1}{15}} = \frac{\frac{-7}{10}}{\frac{1}{15}}$

$\frac{-7}{10} \div \frac{1}{15}$

$\frac{-7}{\cancel{10}} \times \frac{\cancel{15}}{1}$ factor of 5

$\frac{-7}{2} \times \frac{3}{1} = \frac{-21}{2}$

$\mathbf{-10\frac{1}{2}}$

8. Which expression is ***not*** equivalent to $1.5 + (-4.75)$

A. $1.5 - 4.75$
1.5 + (-4.75) KCO
Equivalent

B. $-4.75 - 1.5$
-4.75 + (-1.5) KCO
Not Equivalent

C. $-4.75 + |-1.5|$
-4.75 + 1.5
Equivalent (commutative property)

D. $-4.75 - (-1.5)$
-4.75 + 1.5 KCO
Equivalent (commutative property)

9. When simplified, which numerical expressions below result in a ***positive*** number. **Circle all that apply**.
Hint: *It is not necessary to evaluate the expressions to determine your answer.*

A. $\frac{\left(-\frac{4}{5}\right)\left(\frac{20}{19}\right)}{-\frac{8}{15}}$

$\frac{(-)(+)}{(-)} = \frac{(-)}{(-)} = Pos$

B. $(-1.35)^4 + |-12.7|$

$(-)^4 + |-|$

$(+) + (+) = Pos$

C. $0.\overline{9} - 3\frac{2}{3}$

$0.\overline{9} + \left(-3\frac{2}{3}\right) = Neg$

D. $\frac{-12-5.7}{\frac{4}{3}-\left(-5\frac{1}{7}\right)}$

$\frac{-12+(-5.7)}{\frac{4}{3}+5\frac{1}{7}} = \frac{(-)}{(+)} = Neg$

10. A bank account currently has a balance of $405.50. A deposit is made for $67.45 and then soon after a withdrawal is made for $108.54. What is the new balance?

405.50 + 67.45 – 108.54 or 405.50 + 67.45 + (-108.54)
472.95 – 108.54
364.41
$364.41

11. A pilot was flying his airplane at 20,000 feet above the ground. He recorded the following changes in elevations over the next hour:

-1000.2 +2000.8 -500.5 +1000.2 -2000.8

What was his final altitude at the end of the hour? Explain how you were able to find the new elevation without adding all six numbers.

20,000 – 500.5 = 19,499.5
The pilot's altitude at the end of the hour is 19,499.5 feet.
It wasn't necessary to add all six numbers because there were two pairs of opposites. Adding two opposites (*additive inverses*) creates a sum of zero.

12. Browning, Montana, holds the U.S. record for the greatest temperature drop in one day. On January 23, 1916, the temperature changed by an average of -4.17^0F per hour. To the nearest degree, what was the total temperature change after 24 hours?

4.17 *2 decimal places*
x 24
1668
+ 8340
10008

-100.08^oF **To the nearest degree, the temperature change in 24 hours was -100^oF**

13. Randall had $75 in his bank account. He made 3 withdrawals of $22.50 each. Based on this information, determine if the following statements are true or false.

A. **True/False:** The change in Randall's balance is 67.50. *The balance did not increase by $67.50.*

B. **True/False:** The change in Randall's balance is – 67.50. *The balance has decreased by $67.50.*

C. **True/False:** The account balance is equal to 75 – 3(22.50).

D. **True/False:** The account balance is equal to 75 + 3(–22.50).

E. **True/False:** Randal now has a negative balance.

75 – 3(22.50)
75 – 67.50
7.50

75 + 3(-22.50)
75 + (-67.50)
7.50
Randall's balance is $7.50

14. If the expression **-6x** has a negative value, what are possible values of **x**?

(A.) $x > 0$ B. $x < 0$ C. $x = 0$ D. x = all real numbers

A negative number times a positive number results in a negative value. Since **x** is being multiplied by -6, **x** must be positive and all numbers greater than 0 are positive.