SKILLS PORTFOLIO A
REAL NUMBERS

Answer the following questions in your portfolio:

1. List all the sets of numbers that form the Real Number Set.
For each set, list two elements (numbers) that belong to the set.
What relationships are among these sets of numbers? Use a diagram or your own words.

2. List all symbols used to show a relationship between two real numbers.
Give the meaning of each symbol in words.
For each symbol, give an example with real numbers.

3. Use the words *always, sometimes*, or *never* to make true statements. It is not necessary to rewrite the entire statement in your portfolio.
   - a) The sum of two positive numbers is_____ a positive number.
   - b) The sum of two negative numbers is_____ a positive number.
   - c) The sum of a positive number and a negative number is_____positive.
   - d) The sum of 0 and a negative number is_____ a negative number.

4. Complete the following rules for multiplication and division of positive and negative numbers. It is not necessary to rewrite the entire statement in your portfolio.
   - a) Positive number • positive number = _____ number.
   - b) Positive number • negative number = _____ number.
   - c) Negative number • negative number = _____ number
   - d) Positive number ÷ positive number = _____ number.
   - e) Positive number ÷ negative number = _____ number.
   - f) Negative number ÷ negative number = _____ number.

5. Match each item in Column 1 with the related item in Column 2. It is not necessary to rewrite the columns in your portfolio.

Column 1

1. $x(y+w) = xy + xw$

2. $m \cdot 0 = 0 \cdot m = 0$

3. $ab = ba$

4. $t \times 1 = 1 \times t = t$

5. $a(bc) = (ab)c$

Column 2

a) Commutative property

b) Multiplicative property of 1.

c) Distributive property

d) Multiplicative property of 0

e) Associative property

6. Use the symbol <, >, or = to make each statement true. It is not necessary to rewrite the entire statement in your portfolio.
   a) When $x = y$ we know that $5x$____$5y$

   b) When $-9 = x$, we know that $-(-9)$_____x

   c) When $9 = x$, we know that 12 ____ $x+3$
   d) When $9 < x$, we know that 18 _____ $2x$

7. Tell whether each statement is true or false. It is not necessary to rewrite the entire statement in your portfolio.

a) $(-9)+9=0$

b) $4b+(-4b)=0$

c) $(-15)+(-15)=0$

d) $-(12+7)=19$

e) $-(-4)=4$

f) $|15|=-15$

g) $|6|+|-6|=0$

h) $\dfrac{1}{3}\cdot 3=1$

i) $\sqrt{16}=4$

j) $-\sqrt{121}=-11$

k) $\sqrt{-\dfrac{49}{100}}=\dfrac{7}{10}$

l) $\dfrac{1}{3}+\dfrac{2}{3}=1$

m) $\dfrac{2}{7}-\dfrac{3}{7}=\dfrac{1}{7}$

8. Complete each of the following to make true statements.

a) $9\cdot?=1$

b) $(-5)\cdot?=1$

c) $1=a\cdot?$

d) $\dfrac{-5}{2}=-5\cdot?$

e) $?\div(-3)=1$

f) $?\cdot x=0$

g) $|7|-|-3|=?$

h) $|-9|\cdot?=-18$

i) $3^2\cdot3^?=3^{25}$

j) $\dfrac{1}{?}=7^{-2}$

k) $\sqrt{\dfrac{64}{?}}=\dfrac{8}{9}$

9. Simplify each expression:

a) $-7+[9-(1-3)+4]$

b) $\dfrac{(5-3)^2+2}{4^2-(8+2)}$

c) $(5w^3)(3w^5)$

d) $(-8xy)(x^5y^4)(-4xy)$

e) $x-5[x-5(x-5)]$

f) $4(2x^2-4y)-8(5y-3x^2)$

g) $4a(a^2+3b)+5b^2(a^2-b)$

h) $\dfrac{|-8-4|\div(2-2^2)}{-18\div(-3)^2+|-8|-|-4|}$

i) $x\left[2x^2+x\left(x-3(x-1)\right)\right]$

j) $9\cdot2^3-5\cdot3^2$

k) $(3-6)^2-(2-4)^3$

10. Evaluate each expression.

a) $(x+y)z-(x-y-z)+x-(y-z)$ when $x=-3, y=-4, z=5$

b) $\dfrac{5y-6}{2x+1}$ when $x=-4, y=-3$

c) $xy+y^2$ when $x=-\dfrac{2}{3}, y=\dfrac{4}{5}$

d) $\dfrac{x^2[14-y(x+2)]}{3[xy-z(5y-9)]}$ when $x=3, y=2$ and $z=-1$.