

Foundations for College Algebra - MTWF
University of North Georgia
Fall 2017
Exam #1

Name: Key Date: _____

For full credit ALL work must be shown NEATLY on the exam. Ten points will be deducted off the top for "messy" work! Any "valid" checks are worth an additional point per question.

FOLLOW DIRECTIONS! Ask if you are not sure what is being asked!

Simplify the following. Note: Make sure you are following the "correct" **Order of Operations** by showing **all** appropriate steps

$$\begin{aligned}
 1.) & -2 + (-5) + 2 \cdot 2 \div 2 + |2^3 - 2| - 5 + 2 \\
 & -2 + (-5) + 2 \cdot 2 \div 2 + |8 - 2| - 5 + 2 \\
 & -2 + (-5) + 2 \cdot 2 \div 2 + |6| - 5 + 2 \\
 & -2 + (-5) + 2 \cdot 2 \div 2 + 6 - 5 + 2 \\
 & -2 + (-5) + 4 \div 2 + 6 - 5 + 2 \\
 & -2 + (-5) + 2 + 6 - 5 + 2 \\
 & -7 + 2 + 6 - 5 + 2 \\
 & -5 + 6 - 5 + 2 \\
 & 1 - 5 + 2 \\
 & -4 + 2 \\
 & \boxed{-2}
 \end{aligned}$$

$$\begin{aligned}
 2.) & \frac{1}{2} + \frac{1}{5} \cdot 3 - \frac{1}{4} \\
 & \frac{1}{2} + \frac{3}{5} - \frac{1}{4} \\
 & \frac{5+6}{10} - \frac{1}{4} \\
 & \frac{11}{10} - \frac{1}{4} \\
 & \frac{22-5}{20} \\
 & \boxed{\frac{17}{20}}
 \end{aligned}$$

$$\begin{aligned}
 3.) & \frac{1}{3} - \left(-\frac{5}{3}\right) \\
 & \frac{1+5}{3} \\
 & \frac{6}{3} \\
 & \boxed{2}
 \end{aligned}$$

Convert the given decimals in to fractions.

4.) 0.90

$$\frac{90}{100} = \frac{9}{10}$$

5.) 0.104

$$\frac{104}{1000} = \frac{8 \cdot 13}{8 \cdot 125} = \frac{13}{125}$$

6.) $0.\overline{24}$

$$\begin{aligned} x &= 24\overline{24} \dots \\ 100x &= 24\overline{24}24 \dots \\ -x &= \quad \quad \overline{.24}24 \dots \\ \hline 99x &= 24 \\ x &= \frac{24}{99} = \frac{3 \cdot 8}{3 \cdot 33} = \frac{8}{33} \end{aligned}$$

7.) Use the chart below to place a check mark indicating which sets the item on the left is a member of.

	N	W	Z	Q	Q'	R
2403	✓	✓	✓	✓		✓
$-\pi$					✓	✓
$\frac{4}{3}$				✓		✓
$-\sqrt{2}$					✓	✓

Solve the following equations (for the specified variable).

8.) $c = 5 + \frac{d}{h}$; for h

$$\begin{aligned} h(c = 5 + \frac{d}{h}) \\ hc = 5h + d \\ hc - 5h = d \\ h(c - 5) = d \\ h = \frac{d}{c - 5} \end{aligned}$$

Check

$$\begin{aligned} c &= 5 + \frac{\frac{d}{c-5}}{\frac{d}{c-5}} \\ &= 5 + \frac{d}{1} \cdot \frac{c-5}{d} \\ &= 5 + c - 5 \\ c &= c \quad \checkmark \end{aligned}$$

9.) $g = 4ca - 3ba$; for a (Four Points for Valid Check of #9!)

$$g = a(4c - 3b)$$

$$\frac{g}{4c - 3b} = a$$

Checks

$$\begin{aligned} g &= 4c \left(\frac{g}{4c - 3b} \right) - 3b \left(\frac{g}{4c - 3b} \right) \\ &= \frac{4c g}{4c - 3b} - \frac{3b g}{4c - 3b} \\ &= \frac{g(4c - 3b)}{4c - 3b} \end{aligned}$$

$$g = g \checkmark$$

10.) $\frac{t+5}{-16} = -1$; for t

$$\begin{aligned} -16 \left(\frac{t+5}{-16} = -1 \right) \\ t+5 &= 16 \\ t &= 11 \end{aligned}$$

$$\frac{11+5}{-16} = -1$$

$$\frac{16}{-16} = -1$$

$$-1 = -1 \checkmark$$

11.) $\frac{4}{n^2} = \frac{5}{n} - \frac{1}{n^2}$; for n

$$\begin{aligned} n^2 \left(\frac{4}{n^2} = \frac{5}{n} - \frac{1}{n^2} \right) \\ 4 &= 5n - 1 \\ 5 &= 5n \\ 1 &= n \end{aligned}$$

$$\frac{4}{(1)^2} = \frac{5}{1} - \frac{1}{(1)^2}$$

$$4 = 5 - 1$$

$$4 = 4 \checkmark$$

12.) $7(9+k) = 84$; for k

$$\begin{aligned} 63 + 7k &= 84 \\ 7k &= 21 \end{aligned}$$

$$k = 3$$

$$7(9+3) = 84$$

$$7(12) = 84$$

$$84 = 84 \checkmark$$

13.) $\sqrt{v+3} - 1 = 7$; for v

$$\sqrt{v+3} = 8$$

$$v+3 = 64$$

$$v = 61$$

$$\sqrt{61+3} - 1 = 7$$

$$\sqrt{64} - 1 = 7$$

$$8 - 1 = 7$$

$$7 = 7 \checkmark$$

True or False? You must show why for credit!

14.) $-7^2 = 49$

False

$$\begin{aligned} -7^2 &= (-1) \cdot 7^2 \\ &= (-1) \cdot 7 \cdot 7 \\ &= (-7) \cdot 7 \\ &= -49 \end{aligned}$$

15.) Below is an equation which is being solved for "x". For each line (a, b, c, & d) an **Algebra Power Tool** was used from the line above it. Determine and then state which **Tool** was used to generate the result of each line below.

$$\boxed{3(-4x + 5) - 2x = 8}$$

a.) $-12x + 15 - 2x = 8$ Distribution

b.) $-14x + 15 = 8$ Assoc. / Comm / Assoc.

c.) $-14x = -7$ Additive Inverse

d.) $x = \frac{1}{2}$ Multiplicative Inverse

BONUS (Five Points)

True or False: does $\frac{3x+9}{3} = x + 3$? Support your answer by showing the Algebra for credit!

① $\frac{3x + 9}{3} = x + 3$

$$3x + 9 = 3x + 9$$

$$0 = 0$$

or

② $\frac{3x + 9}{3} = \frac{3x}{3} + \frac{9}{3}$

$$= x + 3$$

} True