

$$60/60 = 100$$

**Foundations for College Algebra**  
**University of North Georgia**  
**Fall 2016**  
**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!**

1. Use the chart below to place a check mark indicating which set(s) the item on the left is a member of.

|                   | N | W | Z | Q | Q' | R |
|-------------------|---|---|---|---|----|---|
| -3                |   |   | ✓ | ✓ |    | ✓ |
| $0.\overline{23}$ |   |   |   | ✓ |    | ✓ |
| $\frac{2}{71}$    |   |   |   | ✓ |    | ✓ |
| $-\pi$            |   |   |   |   | ✓  | ✓ |
| 5                 | ✓ | ✓ | ✓ | ✓ |    | ✓ |

2. True or False? Support your answer for full credit by describing the "meaning" of exponents.

$-7^2 = 49$  *False*       $-7^2$  means  $(-1) \cdot 7^2 = (-1) \cdot 7 \cdot 7$   
 $= (-7) \cdot 7$   
 $= -49$

3. Find the sum of the following:

$$\begin{aligned} & -3 + (-10) + 2 - 22 + |-15 - 3| - 5 + 2 \\ & -3 + (-10) + 2 - 22 + |-18| - 5 + 2 \\ & -3 + (-10) + 2 - 22 + 18 - 5 + 2 \\ & -13 + 2 - 22 + 18 - 5 + 2 \\ & -11 - 22 + 18 - 5 + 2 \\ & -33 + 18 - 5 + 2 \\ & -15 - 5 + 2 \\ & -20 + 2 \end{aligned}$$

-18

4. Simplify

$$|-18 - 19| - 2^2$$

$$|-37| - 4$$

$$37 - 4$$

$$\boxed{33}$$

5. The formula  $F = \frac{9}{5}C + 32$  changes Celsius temperature to Fahrenheit temperature.

A.) Solve the equation for Celsius and B.) Find the temperature if Fahrenheit is 43 degrees, round to nearest tenth.

$$A.) \left( F = \frac{9}{5}C + 32 \right)$$

$$5F = 9C + 160$$

$$5F - 160 = 9C$$

$$\frac{5F - 160}{9} = C$$

$$B.) \frac{5(43) - 160}{9} = C$$

$$\frac{215 - 160}{9} = C$$

$$\frac{55}{9} = C$$

$$6.2 \approx C$$

6. Simplify

$$\frac{\frac{2}{3x} - \frac{1}{5}}{-\frac{5}{x^2}}$$

$$\frac{10 - 3x}{15x}$$

$$-\frac{5}{x^2}$$

$$= \frac{10 - 3x}{15x} \cdot \frac{x^2}{5}$$

$$= \frac{x(10 - 3x)}{75}$$

$$= \frac{10x - 3x^2}{75}$$

7. 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 what **Tool** was used to generate the result of each line.

$3(-4x + 5) - 2x = 8$  Starting Equation

- a.)  $-12x + 15 - 2x = 8$  Distribution  
 b.)  $-14x + 15 = 8$  Comm/Assoc.  
 c.)  $-14x = -7$  Additive Inverse  
 d.)  $x = \frac{1}{2}$  Multiplicative Inverse

8. Use **Order of Operations** to simplify and determine which value is larger.

$$\begin{array}{lcl} (12 - 3^3) - 12 \cdot 5 & ? & -(100 \div 5^2)^2 - 72 \div (-6)^2 \\ (12 - 27) - 12 \cdot 5 & & -(100 \div 25)^2 - 72 \div 36 \\ (-15) - 12 \cdot 5 & & -(4)^2 - 72 \div 36 \\ (-15) - 60 & & -16 - 2 \\ -75 & < & -18 \end{array}$$

-18 is larger than -75

9. Solve for x.

LC D: 30

$$30 \left( \frac{x}{5} - \frac{9}{2} = -\frac{5}{3} \right)$$

$$6x - 135 = -50$$

$$6x = 85$$

$$x = \frac{85}{6}$$

check  $x = \frac{85}{6}$

$$\frac{\frac{85}{6}}{\frac{5}{1}} - \frac{9}{2} = -\frac{5}{3}$$

$$\frac{85}{6} \cdot \frac{1}{5} - \frac{9}{2} = -\frac{5}{3}$$

$$\frac{17}{6} - \frac{9}{2} = -\frac{5}{3}$$

$$\frac{17-27}{6} = -\frac{5}{3}$$

$$-\frac{10}{6} = -\frac{5}{3}$$

$$-\frac{5}{3} = -\frac{5}{3} \checkmark$$

10. Solve for  $x$ .

$$4x - 9(6 - 2x) = 2(5x + 7)$$

$$4x - 54 + 18x = 10x + 14$$

$$22x = 10x + 68$$

$$12x = 68$$

$$x = \frac{68}{12} = \frac{17}{3}$$

check  $x = \frac{17}{3}$

$$4\left(\frac{17}{3}\right) - 9\left(6 - 2\left(\frac{17}{3}\right)\right) = 2\left(5\left(\frac{17}{3}\right) + 7\right)$$

$$\frac{68}{3} - 9\left(6 - \frac{34}{3}\right) = 2\left(\frac{85}{3} + 7\right)$$

$$\frac{68}{3} - 9\left(\frac{18 - 34}{3}\right) = 2\left(\frac{85 + 21}{3}\right)$$

$$\frac{68}{3} - 9\left(-\frac{16}{3}\right) = \frac{212}{3}$$

$$\frac{68}{3} + \frac{144}{3} = \frac{212}{3}$$

$$\frac{68}{3} + \frac{144}{3}$$

$$\frac{212}{3}$$

$$= \frac{212}{3} \checkmark$$

11. Rewrite the following using the *Distributive Tool*:  $aby - 3b + 5xy - b^2$

$$b(ay - 3 + 5xy - b)$$

12. Is  $x = -\frac{2}{3}$  and  $-\frac{26}{33} = \frac{13}{11}x$  equivalent equations? Support your answer by showing your Algebra.

yes

$$-\frac{26}{33} = \frac{13}{11} \cdot \left(-\frac{2}{3}\right)$$

$$-\frac{26}{33} = -\frac{26}{33} \checkmark$$

or

$$33\left(-\frac{26}{33} = \frac{13}{11}x\right)$$

$$-26 = 39x$$

$$-\frac{26}{39} = x$$

$$-\frac{2}{3} = x$$

13. If two numbers are added and the result is zero, what *Algebra Power Tool* was used?

*Additive Inverse*

$$5 + (-5) = 0$$

14. Solve the following equation by **using and stating** the "correct" *Algebraic Power Tool* for each new line you write as done in class. Hint: pay close attention to what tool you select!

$$\phi(\forall + \odot) - ! = \infty, \text{ for } \forall$$

$$\phi \forall + \phi \odot - ! = \infty \text{ Dist}$$

$$\phi \forall = \infty - \phi \odot + ! \text{ A.I.}$$

$$\forall = \frac{\infty - \phi \odot + !}{\phi} \text{ M.D.}$$

15. True or False: does  $\frac{3x+9}{3}$  simplify to  $x+3$ ? **Support your answer.**

*True*

$$\textcircled{1} \frac{3x+9}{3} = \frac{3x}{3} + \frac{9}{3}$$

$$= x + 3$$

*or*

$$\textcircled{2} \frac{3x+9}{3} = \frac{\cancel{3}(x+3)}{\cancel{3}} = x+3$$

*or*

$$\textcircled{3} 3\left(\frac{3x+9}{3}\right) = x+3$$

$$3x+9 = 3x+9 \checkmark$$