

MTH 60, Fall Term 2010  
Test 1 – Given October 11, 2010

Name Key

**Please read all directions carefully – your test score will be affected if you fail to read and follow directions. If you use a calculator, cell phone, or any other device with electronic calculating capabilities while taking this test you will receive a score of 0 for the test.**

**Section 1 – State the “answer”**

In this section, the “answer” is all I am looking for. Write each final “answer” in the provided blank. Please perform any and all scratch work in the provided scratch zones. Please make sure that you double check your answers before turning in your test.

1. Completely simplify each arithmetic expression. Completely reduce all fractions. Do *not* change improper fractions to mixed numbers and do not interchange decimals and fractions.  
(1.5 point each)

$$-9 + 4 = \underline{-5}$$

$$-30 - (-30) = \underline{0}$$

$$4 + (-8) = \underline{-4}$$

$$-30 + (-30) = \underline{-60}$$

$$13 - 2 - (-8) = \underline{19}$$

$$-3.6 + 2.1 = \underline{-1.5}$$

$$-1^6 = \underline{-1}$$

$$1 - \frac{2}{3} + \left(-\frac{5}{6}\right) = \underline{-\frac{1}{2}}$$

$$8 \div 4 \cdot 2 = \underline{4}$$

$$3.5 + (-45) + (-8.4) + 72 = \underline{22.1}$$

$$\left(-\frac{3}{5}\right)\left(-\frac{4}{7}\right) = \underline{\frac{12}{35}}$$

$$5\pi - 2\pi = \underline{3\pi}$$

Scratch Zone

2. Completely simplify and/or evaluate each algebraic expression and write each result in its provided blank. (1.5 points each)

a. Simplify  $3(x + 5)$ .

a.  $3x + 15$

b. Simplify  $7 - (x - 7)$ .

b.  $-x + 14$

c. Simplify  $5(3x + 2) + 12$

c.  $15x + 22$

d. Simplify  $12 + 5(3x + 2)$ .

d.  $15x + 22$

e. Simplify  $4 - 6b - 8 - 3b$ .

e.  $-9b - 4$

f. Simplify  $(2x + 5) + (7x - 4)$ .

f.  $9x + 1$

g. Simplify  $8(4y + 3) + (-35)$

g.  $32y - 11$

h. Evaluate  $2x + y$  when  $x = 7$  and  $y = 5$ .

h.  $19$

i. Evaluate  $x^4$  when  $x = -2$ .

i.  $16$

j. Evaluate  $20 - \frac{1}{3}z$  when  $z = 12$ .

j.  $16$

Scratch Zone

**Section 2 – Show your work**

In this section, the "answer" is obviously still very important, but I will also be evaluating your ability to show the steps and organize your work as discussed, illustrated, and practiced in class. Please make sure that you double check your answers before turning in your test. Please make sure that you've done things like lining up equal signs, stating variable values (where appropriate), etc.

3. Completely simplify each expression. To earn full credit you must show at least one step between the original expression and your final simplification. Beyond that, show the steps that help *you* successfully complete the problem. (6 points each)

a. Completely simplify  $3[5(x-2)+1]$ .

$$\begin{aligned} 3[5(x-2)+1] &= 3[5x-10+1] \\ &= 3[5x-9] \\ &= 15x-27 \end{aligned}$$

b. Completely simplify  $2(3x^2-5)-[4(2x^2-1)+3]$ .

$$\begin{aligned} 2(3x^2-5)-[4(2x^2-1)+3] &= 2(3x^2-5)-[8x^2-4+3] \\ &= 2(3x^2-5)-(8x^2-1) \\ &= 6x^2-10-8x^2+1 \\ &= -2x^2-9 \end{aligned}$$

4. Evaluate each expression. To earn full credit you must show at least one step between the original expression and your final simplification; you must also set up your work in the way discussed in class. Beyond that, show the steps that help *you* successfully complete the problem. (4 points each)

- a. Evaluate  $\frac{21}{x} + \frac{35}{y}$  when  $x = 7$  and  $y = -5$ .

when  $x = 7$  and  $y = -5$ :

$$\begin{aligned}\frac{21}{x} + \frac{35}{y} &= \frac{21}{7} + \frac{35}{-5} \\ &= 3 + (-7) \\ &= -4\end{aligned}$$

- b. Evaluate  $|x - y|$  when  $x = 5$  and  $y = 9$ .

when  $x = 5$  and  $y = 9$

$$\begin{aligned}|x - y| &= |5 - 9| \\ &= |-4| \\ &= 4\end{aligned}$$

- c. Evaluate  $-x^2 - 10x$  when  $x = -1$ .

when  $x = -1$ :

$$\begin{aligned}-x^2 - 10x &= -(-1)^2 - 10(-1) \\ &= -1 + 10 \\ &= 9\end{aligned}$$

5. Completely simplify each arithmetic expression carefully illustrating the steps in order of operations. To earn full credit you must show the order of operations steps one step at a time. (5 points each)

a. Simplify  $3(-2)^2 - 4(-3)^2$ .

$$\begin{aligned} 3(-2)^2 - 4(-3)^2 &= 3(4) - 4(9) \\ &= 12 - 36 \\ &= -24 \end{aligned}$$

b. Simplify  $2[5 + 2(9 - 4)]$ .

$$\begin{aligned} 2[5 + 2(9 - 4)] &= 2[5 + 2(5)] \\ &= 2[5 + 10] \\ &= 2(15) \\ &= 30 \end{aligned}$$

**Section 3 – Vocabulary! ☺**

Answer each question as best as you can. Do not worry about writing complete sentences; just make sure that your answers are clear. Please make sure that you double check your answers before turning in your test. (1 point each)

6. The equation  $(8 + 2) + (1 + 7) = (1 + 7) + (8 + 2)$  illustrates what property?

Commutative Property of addition

7. What is the property that is illustrated by the equation  $5 + (8 + 3) = (5 + 8) + 3$ ?

associative property of addition

8. What is the property that is illustrated by the equation  $(5 + 8)(7 + 9) = (7 + 9)(5 + 8)$ ?

Commutative property of multiplication

9. Which of these numbers are whole numbers?  $-9, -\frac{4}{5}, 0, \sqrt{3}, \sqrt{100}, 9.2$

0,  $\sqrt{100}$

10. Which of these numbers are natural numbers?  $-9, -\frac{4}{5}, 0, \sqrt{3}, \sqrt{100}, 9.2$

$\sqrt{100}$

11. Which of these numbers are irrational numbers?  $-9, -\frac{4}{5}, 0, \sqrt{3}, \sqrt{100}, 9.2$

$\sqrt{3}$

12. Write down an example of a number that is a rational number but not an integer.

$\frac{2}{3}$

13. What is the correct result if you multiply 2 by its additive inverse?

-4

**Section 4 – Freeform answer**

Determine the answer to each question as best as you can **showing all of the work that is relevant to determining your answer**. I will not deduct points for the way your work is organized so long as it is organized in a reasonable manner. To earn full credit, you do need to make sure that your conclusion is clear. Please make sure that you double check your answers before turning in your test.

14. Is 3 a solution to the equation  $x^2 + 4x = -x + 24$ ? (5 points)

$$3^2 + 4(3) \stackrel{?}{=} -3 + 24$$

$$9 + 12 = 21 \text{ True!}$$

3 is a solution to  $x^2 + 4x = -x + 24$

15. Is  $1\frac{1}{3}$  a solution to the equation  $\frac{2}{3}y + \frac{5}{6}y = 2$ ? (5 points)

$$y = 1\frac{1}{3} = \frac{4}{3}$$

$$\frac{2}{3} \left( \frac{4}{3} \right) + \frac{5}{6} \left( \frac{4}{3} \right) \stackrel{?}{=} 2$$

$$\frac{8}{9} + \frac{20}{18} \stackrel{?}{=} 2$$

$$\frac{8}{9} + \frac{10}{9} \stackrel{?}{=} 2$$

$$\frac{18}{9} = 2 \text{ True! } \checkmark$$

$1\frac{1}{3}$  is a solution to  $\frac{2}{3}y + \frac{5}{6}y = 2$



16. Translate each of the following into an expression or an equation and indicate whether the result is an expression or whether it is an equation. In each case let  $x$  represent the unknown number. (8 points)

- a. a number decreased by  $\frac{1}{3}$  added to half of the number

$$\frac{x}{2} + \left(x - \frac{1}{2}\right) \quad \text{This is an expression.}$$

- b. 6 more than the product of  $\frac{3}{4}$  and a number is 3 less than the original number.

$$\frac{3}{4}x + 6 = x - 3 \quad \text{This is an equation.}$$

17. The peak of Mount Kilimanjaro, the highest point in Africa, is 19,321 feet above sea level. Qattara Depression, Egypt, one of the lowest points in Africa, is 426 feet *below* sea level. What is the difference in elevation between the peak of Mount Kilimanjaro and the Qattara Depression? State your conclusion using a complete sentence. (4 points)

$$19,321 \text{ ft} - (-426 \text{ ft}) = 19,321 \text{ ft} + 426 \text{ ft} \\ = 19,747 \text{ ft}$$

The difference in elevation is 19,747 ft

18. For each statement circle T if the statement is true and circle F if the statement is false. (3 points)

☒ T or ☐ F  $-10 \leq 2$

T or ☒ F  $\pi \leq 3.14$

T or ☒ F  $-2^2 > 2$

☒ T or ☐ F  $8 \div 4 \cdot 2 \geq 4$

☒ T or ☐ F  $|-10| > |-5|$

☒ T or ☐ F  $(-3)^2 > (-1)^2$