

MAT103: Fundamentals of Mathematics I**Worksheet on Sections 5-1 and 5-2: Integer Arithmetic (Including Order of Operations)**

Overview: Chapter 5 reinforces many skills already covered in this course as well as providing a refresher regarding arithmetic skills learned in middle school and honed in high school math classes. Specifically, this chapter pertains to the notion of integers and number theory. While we will cover the number theory portions of the chapter thoroughly in class, arithmetic involving integers is assumed to have been mastered in your past math classes. Therefore, this packet is designed to review those skills.

First, recall that the integers can be defined using set notation (Chapter 2) as follows:

$$\mathbb{I} = \{ \dots, -3, -2, -1, 0, 1, 2, 3, \dots \}$$

OR

$$\mathbb{Z} = \{ \dots, -3, -2, -1, 0, 1, 2, 3, \dots \}$$

The textbook uses the letter \mathbb{I} to represent the integers, but we discussed it as the set \mathbb{Z} earlier in this course. Regardless of the letter used to represent the set, the integers can be defined as the natural (or counting) numbers, their opposites, and zero.

Another item you will need to recall in order to complete this packet (and the arithmetic in this chapter and beyond) is the Order of Operations, discussed earlier in this course and summarized as follows:

1. Parentheses (all grouping symbols, including absolute value, from the inside out)
2. Exponents (also called powers)
3. Multiplication and Division (in order from left to right)
4. Addition and Subtraction (in order from left to right)

Unless otherwise directed, all mathematical calculations are to be performed using the Order of Operations outlined above. A mnemonic device often used to remember the Order of Operations is, "Please Excuse My Dear Aunt Sally," abbreviated, "PEMDAS." This acronym reminds us to handle Parentheses first, followed by Exponents, then Multiplication and Division in order from left to right, and lastly Addition and Subtraction, also in order from left to right.

Directions: Using the information discussed above and your past knowledge of arithmetic involving integers (or "signed numbers"), complete the exercises on the pages that follow without the use of a calculator.

It is crucial you are able to obtain the correct answers to these exercises without the use of a calculator as you may be expected to do so on upcoming quizzes and exams.

1. $8 + 3$
2. $34 + 17$
3. $2 + -5$
4. $35 + -16$
5. $-9 + 7$
6. $-46 + 28$
7. $-6 + -1$
8. $-65 + -49$
9. $5 - 9$
10. $44 - 16$
11. $8 - -3$
12. $56 - -12$
13. $-3 - 3$
14. $-91 - 47$
15. $-5 - -4$
16. $-62 - -19$

17. $4 \cdot 5$
18. $11 \cdot 38$
19. $7 \cdot -2$
20. $42 \cdot -36$
21. $-9 \cdot 6$
22. $-50 \cdot 16$
23. $-2 \cdot -3$
24. $-21 \cdot -24$
25. $6 \div 2$
26. $96 \div 24$
27. $9 \div -3$
28. $40 \div -20$
29. $-8 \div 4$
30. $-65 \div 13$
31. $-4 \div -2$
32. $-84 \div -12$

33. 8^2

34. -9^2

35. -2^4

36. $(-2)^3$

37. $2 \cdot 5 + 6$

38. $3 - 4 + 2$

39. $6 + 8 \div 2$

40. $8 \div 2 + 2$

41. $7 - 5 \cdot 8$

42. $3 + (6 - 1) \cdot 4$

43. $(2 - 7) + 5^2$

44. $(2 + 3)^2$

45. $(5 - 6)^2$

46. $(-4 + 3)^3$

47. $|2 - 3| + 4$

48. $7 \cdot |3 - 5|^2$

49. $-4^2 + |-5 - (2 + 1)|$

50. $-6 - (-2 - |-4 - 8|^2) \cdot -2$