CHAPTER 1 STUDY GUIDE (INTEGERS)

1.1 <u>Opposites and Absolute Value</u> examples on pages 2-4 *(see Chapter 1.1 notes)*

➤   **Tips:** Opposites are two numbers located in opposite directions on a number line, but the same distance from zero. An additive inverse is the same as an opposite. Absolute value measures the number of units from zero. The absolute value of any non-zero number will always be <u>positive</u>.

1.   What is the opposite of 2^3?

2.   What is the opposite of –5?

3.   What is the additive inverse of –123?

4.   What is the additive inverse of $(–3)^2$?

5.   Solve. $|-5^2|$

6.   Solve. $|-28 + 7^0|$

7.   Simplify and rewrite from least to greatest using < sign.
$$-|23| \ , \ -3^2 \ , \ (-3)^2 \ , \ (-6 \times 2) \ , \ (-3 \times -5)$$

1.2 <u>Adding Integers</u> examples on pages 6-8 *(see Chapter 1.2 notes)* **– Add numbers below**

➤   **Tips:** On a number line, positive numbers always move to the right and negative numbers always move to the left.

8.   5 + (–2)

9.   –18 + (–3)

10. 6 + (–26)

11. 23 + (–17) + (–5)

12. –16 + 27 + 13

13. –31 + 15 + (–7)

1.3 <u>Subtracting Integers</u> examples on pages 10-11 *(see Chapter 1.3 notes)* **– Subtract numbers below**

➤   **Tips:** When both numbers are the same sign add them together **(pos + pos = more positive)** or **(neg + neg = more negative)**.

➤   **Tips:** When you subtract a negative number **(minus a minus)**, the number becomes a **positive number** (two negatives will cancel each other).

14. –9 – (–12)

15. 3 – (–8)

16. –6 – 7

17. 2 – (–18)

18. –4 – 6

19. –17 – (–12)

1.4 <u>Multiplying Integers</u> examples on pages 15-17 *(see Chapter 1.4 notes)* **– Multiply numbers below**

➤   **Tips:** If two numbers being multiplied have different signs **(– ● +)** the answer will be **negative (–)**.

➤   **Tips:** If two numbers being multiplied have the same sign **(+ ● +)** or **(– ● –)**, the answer will be **positive (+)**.

➤   **Tips:** When multiplying more than two numbers, if there are an <u>**odd**</u> number of negative signs the answer will be **negative (–)**.

➤   **Tips:** When multiplying more than two numbers, if there are an <u>**even**</u> number of negative signs the answer will be **positive (+)**.

20. 5(–8)

21. –2(–15)

22. –4(– 5)

23. –4(–2)(–3)(2)

24. –2(–2)(–3)(–2)

25. 3(–7)(3)(–1)

1.5 <u>Dividing Integers</u> examples on pages 19-21 *(see Chapter 1.5 notes)* **– Divide numbers below**
➢ **Tips:** When dividing numbers with different signs **(– ÷ +)** the answer will be **negative (–)**.
➢ **Tips:** When dividing numbers with the same sign **(+ ÷ +)** or **(– ÷ –)** the answer will be **positive (+)**.

26. $\dfrac{-22}{-11}$

27. $\dfrac{25}{-5}$

28. $\dfrac{-36}{9}$

29. $150 \div 25$

30. $-90 \div -30$

31. $48 \div -4$

1.6 <u>Exponents</u> examples on pages 23-26 *(see Chapter 1.6 notes)*
➢ **Tips:** An exponent is a superscript located to the upper-right of a number (or letter) that tells how many times that base number is repeated.
➢ **Tips:** When dealing with exponents, always look to see what it is touching. Ask yourself is it touching a number or is it touching a parenthesis?
➢ **Tips:** If the same base number is being multiplied, add the exponents.
➢ **Tips:** If there is a power-to-a-power, multiply the exponents.
➢ **Tips:** Assuming the same base number in the numerator and denominator, if both exponents are positive move the <u>smaller</u> exponent (cross the line, change the sign). If an exponent is negative, move it from the denominator to numerator or from the numerator to denominator.
➢ **Tips:** Any none zero base number to the zero power is always equal to 1.

32. Write in expanded form. x^5

33. Write in expanded form. a^{-3}

34. Write in exponential form. $y \times y$

35. Write in exponential form. $-3 \times -3 \times -3$

36. Simplify. $p^4 \times p^3$

37. Simplify. $z^6 \times z^7 \times z^3$

38. Simplify. $(a^2)^4$

39. Simplify. $(n^3)^7$

40. Simplify. $\dfrac{g^7}{g^2}$

41. Simplify. $\dfrac{2^5 \times 2^5}{(2^2)^3}$

1.7 <u>Order of Operations</u> examples on pages 31-33 *(see Chapter 1.7 notes)* **– Simplify**
➢ **Tips:** PEMDAS = (**P**)arenthesis (**E**)xponents (**M**)ultiplication (**D**)ivision (**A**)ddition (**S**)ubtraction
➢ **Tips:** (1) Symbols of grouping (2) Exponents (3) Multiplication & Division (from left to right) (4) Addition & Subtraction (from left to right)

42. $12 \div 2 + (8 + 4) \times 2 \div 3$

43. $-3^2 - (16 + 14) \div 5$

44. $|-24| \div 2^3 - (7 + 5) \times 3 \div 9$

1.8 <u>Scientific Notation</u> examples on pages 35-37 *(see Chapter 1.8 notes)*
➢ **Tips:** Scientific Notation is expressed as a decimal number between 1-10, then multiplied by a power of ten.
➢ **Tips:** Positive exponents equal larger numbers and negative exponents equal smaller numbers.

<u>Write in scientific notation (45-47):</u>
45. 5,240,000

46. −0.000872

47. 1,250

<u>Write in standard form (48-50):</u>
48. -7.34×10^{-4}

49. 2.55×10^6

50. 1.39×10^{-2}