

**Algebra I Midterm Review 2010** Name: \_\_\_\_\_ Period: \_\_\_\_\_

Use this sheet as a study guide. If you know each of the topics listed, you should be ready for the exam. The exam covers A LOT of material...you must STUDY! The exam is 90 minutes long. You should NOT finish in fewer than 75 minutes. GOOD LUCK!

Exam Date: Thursday January 21

Review Day/AMS: We will review in class on Thursday the 14<sup>th</sup> and Friday the 15<sup>th</sup>, and I will be available after school for AMS. Please come see me with any questions you may have.

Review Assignment: 2 parts, due Thursday January 14th and Friday January 15th

### CHAPTER ONE: Exploring Expressions, Equations and Functions

- **Variables**
  - **Algebraic Expressions** → 1. variables 2. arithmetic operations
  - **Verbal Phrases**
  - **Exponents** → power – 1. exponent 2. base
  - **Patterns** - how to find the nth sequence/10<sup>th</sup> term
  - \*\*\*\*\* P.E.M.D.A.S (Order of Operations) \*\*\*\*\*
  - **Equation/Inequality**
  - **Properties** – you must be able to identify all of the properties (identity, commutative, etc.)
  - **Like Terms** → must be same variable AND same power (exponent)
  - **Coefficient** → numerical factor
  - **Simplest Form** → 1. NO parenthesis 2. NO like terms
  - **Constant**
  - **Combining Like Terms**
  - **Distributing**
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### CHAPTER TWO: Exploring Rational Numbers

- **Sets of Numbers: i.e. Integers** (-3, -2, -1, 0, 1, 2...)
- **Absolute value** – its distance from zero on a number line
- **Adding/Subtracting Integers**
  - o SAME SIGN → add their absolute values, give the result the same sign
  - o DIFFERENT SIGNS → subtract the lesser absolute value from the greater absolute value, give the result the sign of the greater absolute value
- **Additive inverse** (opposite)– for every number a,  $a + (-a) = 0$
- **Subtracting** → add its additive inverse (keep change change)
- **Rational Numbers (FRACTIONS AND DECIMALS)**
  - o Comparing
  - o Finding a number between
- **Adding/Subtracting Rational Numbers**

- Same rules as integers
  - Common denominators
  - **Multiplying Rational Numbers**
    - SAME SIGN → Positive
    - DIFFERENT SIGNS → Negative
  - **Dividing Rational Numbers**
    - SAME SIGN → Positive
    - DIFFERENT SIGNS → Negative
    - Divide by fraction → Multiply by reciprocal
  - **Complex fractions**
  - **Square Roots/Irrational Numbers**
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### CHAPTER THREE: Solving Linear Equations

- **Solving equations**
    - 1- step, 2-step, Multi-Step, Fractions, Special Case Division, Variables on Both Sides, Special Cases (No solution, Identity)
  - **STEPS IN SOLVING EQUATIONS:**
    1. Distributive Property
    2. Combine like terms and numbers (exponents, fractions, etc.)
    3. ADDITION/SUBTRACTION
      - a. Get variables on one side, numbers on the other
    4. DIVISION/MULTIPLICATION
      - a. Get variable with a coefficient of 1
  - Solving Formulas/Solving for a given variable
  - Writing equations from sentences/Word Problems
  - Central Tendency (Mean, Median, Mode)
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### CHAPTER 4: RATIOS AND PROPORTIONS

- Ratio
- Proportions
- Percents
  - Finding the "is", "of", "%"
- Percent Change
- Probability(successes/possibilities)
- Odds (successes: failures)

### Helpful studying and test-taking hints...

- ✓ Identify each term, operation, and topic on this sheet

- ✓ Do all the problems at home and have your answers completed when you come to class. This way, when we go over the questions in class you will already know what you need to ask about.
- ✓ Take advantage of AMS and study sessions
- ✓ Consolidate your notes. Take your math notes, and re-write them using only the highlights of the chapter. This approach will help you in two ways:
  1. You will refresh all the topics by re-writing them
  2. You will have a succinct document to use both in class and at home while studying
- ✓ Don't hurry through the exam. Take your time and check your answers.
- ✓ Do practice problems that you already have the answers to. Do the problems without looking at the answers and then check them when you are done. This way, you will know if you are correct.
- ✓ You **MUST** study the night before! There is so much material on this exam. You can't assume that you already know it. There are things that you may have forgotten. You **MUST** review them.
- ✓ Pay attention to details. While taking the test, watch your operations. Try not to make careless mistakes. Watch your signs and pay attention to positives and negatives.
- ✓ Make sure your answers are **REASONABLE** and you have **ANSWERED THE QUESTION THAT WAS ASKED.**
- ✓ Don't panic! This is a **BIG** one! When you sit to take the exam, start with a problem you know how to do. Even if you have to skip ahead, always start with a question you are certain about. This will calm you down so you can go back to the other problems. **RELAX** and **THINK.**
- ✓ Do your best. Walk out of the exam knowing that you studied and did the best you could.

Period: \_\_\_\_\_

DUE: Thursday, JANUARY 14<sup>h</sup> 2010

**Evaluate** the following using **PEMDAS**:

1)  $(-3)^2$  and  $-3^2$  (why is one answer positive and one answer negative?)

2)  $5 + 10 \div 5 - 3$

3)  $(-3 - 4) + 7 \cdot 6 - 2$

4)  $9 - 6 + 4$

5)  $18 \div 9 \cdot 5$

6)  $25 - (14 - 3^2) + 2 \cdot 7$

7)  $(10 - 3)^2 + 5 - (2 \div 1)^2$

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**Simplify** the following:

8)  $-2 + 6$

9)  $16 - 39$

10)  $-23 + 49$

11)  $-16 - (-3)$

12)  $-19 - 32$

13)  $-12 \cdot 3$

14)  $102 \cdot 2 \cdot 0$

15)  $64 \div (-4)$

16)  $\frac{2}{3} \cdot \frac{1}{8}$

17)  $\frac{6}{11} \div \frac{2}{5}$

18)  $8 \cdot \frac{4}{5}$

19)  $2\frac{5}{6} \cdot 3\frac{1}{2}$

20)  $\frac{1}{5} + \frac{3}{5}$

21)  $8\frac{2}{5} - 5\frac{7}{10}$

22)  $\frac{-5}{5/6}$

23)  $\frac{-7}{11} + \frac{-4}{11}$

24)  $-2\frac{1}{3} + \frac{4}{5}$

**Evaluate** the following if  $a = 2$   $b = -6$   $c = 3$   $d = 12$   $e = -4$

25)  $ab^2c$

26)  $|b|$

27)  $a - b$

28)  $|e| + |d|$

29)  $\frac{d}{b}$

30)  $|e + d|$

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Solve the following equations. Checking is suggested.

31)  $6x + 22 = 10$

32)  $\frac{x}{3} - 4 = 2$

33)  $\frac{3}{5}x + 2 = 5$

34)  $x + 7.3 = 4.2$

35)  $\frac{x+12}{-4} = 5$

36)  $12x - 8 + 2x - x - 1 = -87$

37)  $8 - 2(x + 1) = -3x + 1$

38)  $6x - 3 = 2x + 13$

39)  $7 - 3x = x - 4(2 + x)$

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Write an equation and solve the following:

40) Twenty-three less than a number is 42. Find the number.

41) Five minus two times a number is equal to the one-half the number plus 6. Find the number.

DUE: Friday, JANUARY 15th 2010

For the following sequences, find the 10<sup>th</sup> term and the N<sup>th</sup> term:

1) 2, 4, 6, 8, ....      10<sup>th</sup>: \_\_\_\_\_      N<sup>th</sup>: \_\_\_\_\_

2) 4, 13, 22, 31, ...      10<sup>th</sup>: \_\_\_\_\_      N<sup>th</sup>: \_\_\_\_\_

Use the following pattern for questions 3 and 4:



3) Find the 20<sup>th</sup> shape in the pattern:

4) Find the 127<sup>th</sup> shape in the pattern:

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Simplify the following expressions involving decimals:

5)  $1.23 + 13.4$

6)  $-12.4 \div 4$

7)  $4.68 \cdot 1.09$

8)  $3.7 - 2.114$

9)  $11.5 \div 1.25$

10)  $-4.897 + 9.6$

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Solve the following formulas for the variable specified.

11)  $3a + b = c$  for a

12)  $\frac{x+t}{k} = p$  for t

13)  $y = mx + b$  for m

14)  $I = prt$  for t

Decide if the following ratios are proportional using cross products. Write PROPORTIONAL or NOT PROPORTIONAL and show your work.

15)  $\frac{2}{13} = \frac{6}{39}$

16)  $\frac{0.3}{1.2} = \frac{0.4}{1.5}$

17)  $\frac{1.6}{2} = \frac{3.2}{4}$

Solve the following proportions:

18)  $\frac{2}{3} = \frac{x}{39}$

19)  $\frac{4}{x-4} = \frac{2}{5}$

20)  $\frac{1.1}{0.6} = \frac{8.47}{x}$

21)  $\frac{x}{9} = \frac{-7}{16}$

22)  $\frac{x+5}{3} = \frac{x-2}{-4}$

23)  $\frac{1/4}{8} = \frac{2}{x}$

Use the percent proportion to answer the following questions:

24) What is 75% of 36?

25) Twelve is what percent of 20?

26) Find 30% of 90.

27) Twelve is 40% of what number?

28) 43.6 is what percent of 40?

29) 83.5 is 20% of what number?

30) A sweater costs \$65.00 but is on sale - 25% off. How much is the sweater now?

31) You take a date to dinner and the bill is \$65. The server was great so you leave a 20% tip. How much is your total bill for the night?

Determine the probability/odds of each event when choosing cards from a deck.

32) P(5)

33) P(9 hearts)

34) P(red or black)

35) odds of choosing a club

36) odds of choosing an even number