Name: _____

Due Date: January 22, 2013

Kim/Groot/VanderHeide

Grade Nine Math: Semester One Review

Section A: Integers...../_____**11K**

Page 1 ...../_____8K

Page 2 ...../_____3K

Section B: Rational Numbers...../_____ **24A**

Page 1...../ _____13A

Page 2...../_____11A

Section C: Statistics ...../_____ 9A

Section D: Exponent Rules...../_____**18K**

Page 1...../_____14K

Page 2...../_____4K

Section E: Polynomials...../_____**16A**

Page 1...../_____10A

Page 2...../_____6A

Section F: Equations and Inequations...../_____8K

/_____12T

Page 1...../_____8K

/_____6T

Page 2...../_____6T

Section G: Word Problems...../_____28T

/_____11C

Page 1...../_____6T

/_____1C

Page 2...../_____6T

/_____3C

Page 3...../_____ 4T

/_____2C

Page 4...../_____6T

/_____2C

Page 5...../_____6T

/_____3C

Section H: Pythagorean Theorem...../_____7A

Overall organization and layout...../_____10C

Total _____/37K _____/56A _____/40T _____/21 C

_____100%

Grade Nine Math: Semester One Review

Section A: Integers

- ✔ Knowing what integers are: examples, which one is larger or smaller, how they are different from natural, whole, rational, and real numbers
- ✔ Working with integers: +, −, ÷, ×, BEDMAS
- ✔ Graphing on an integer number line
- ✔ Substituting for variables and evaluating
- ✔ Using integers in word problems

Section B: Rational Numbers

- ✔ Knowing what rational numbers are: examples, which one is larger or smaller, how they are different from irrational numbers
- ✔ Working with rational numbers: +, −, ÷, ×, BEDMAS
- ✔ Changing from mixed numbers to improper fractions and vice-versa
- ✔ Changing decimals to fractions (lowest terms)
- ✔ Changing fractions to decimals (repeating and non-repeating decimals, terminating and non-terminating decimals, periodic and non-periodic decimals, period and length)
- ✔ Using rational numbers in word problems

Section C: Statistics

- ✔ Calculating the mean, median and mode of a group of data
- ✔ Making bar, line and circle graphs for given data

Section D: Exponent Rules

- ✔ Knowing and using exponent rules: when to add exponents, subtract exponents, multiply exponents

Section E: Polynomials

- ✔ Knowing these words and what they mean: variable, constant, coefficient, term, monomial, binomial, trinomial, polynomial, degree of a polynomial, like terms, unlike terms, descending order. Being able to give examples for each one.
- ✔ Working with polynomials: +, −, ÷, ×, BEDMAS
- ✔ Expanding polynomials
- ✔ Combining like terms
- ✔ Simplifying fully which is expanding, combining like terms, and putting into descending order
- ✔ Dividing polynomials by monomials
- ✔ Finding perimeters and areas (of polygons)

Section F: Solving Equations

- ✔ Knowing the difference between simplifying an expression and solving an equation
- ✔ Knowing how to use the four main rules for solving equations: adding something to both sides, subtracting something to both sides, multiplying something to both sides, and dividing something on two sides
- ✔ Knowing how to check for correct answers
- ✔ Solving equations by using polynomial skills and equation rules so that the variable ends up by itself on one side and the answer on the other side
- ✔ Solving inequations using the way to solve equations with one extra rule: when dividing or multiplying each side of an equation by a negative value, switch the sign (eg. < becomes >)

- ✔ Graphing answers to inequations on the real number line (use ● when the answer includes = and ○ when the answer is only < or >.)
- ✔ Graphing answer to inequations on the integer line.

Section G: Word Problems

- ✔ Changing words and sentences into expressions and equations
- ✔ Using good problem solving form: Find or Let statement, Given information (eg. diagram, numbers, formulas, chart), Solution (usually an equation but otherwise a clear, organized way of getting the answer), Conclusion in sentence form. The check is optional but recommended.
- ✔ Knowing perimeter and area formulas for rectangles and squares
- ✔ Knowing how to do speed-distance-time problems and rate problems

Section H: Pythagorean Theorem

- ✔ $a^2 + b^2 = c^2$ Knowing that in a right angled triangle, the square of the longest side is equal to the sum of the squares of the other two sides.

Math Exam Review Package

You are required to complete the review package and hand it in to your Math teacher on the day of the exam. Make sure you do the following:

Show all the steps you took to solve the problems (and don't forget the concluding statements for word problems!)
Be sure to ask for help for those questions which you don't understand.
Plan to spend 5 or 6 hours.

When did you start working on your review package?

How many hours did you work on it?

How prepared do you feel for the exam?

Remember there's after-school help available on Thursdays!

Section A: Integers

Name:_____

1. List the integers from smallest to largest: -2, 4, -6, 0, -1, -7, 5 (1K)

Identify each integer. (½ K each)

2. 5 less than 3

3. 6 more than -1

4. 4 less than 2

5. 7 less than 0

List and graph. (½ K each)

6. Integers less than 2 and greater than -1.

7. Integers less than -3 and greater than -8.

Simplify. (½ K each)

8. $-3 + 4 - 7$

9. $-2 - 5 - 6$

10. $-2(-2) + 4$

11. $(-3)^2 - 5$

12. $3(-2) - 4 \div 2$

13. $-6 - 12 \div (-6)$

14. $-5(-1) - 4(-3)$

15. $(-3)(-2) + (-1)^2$

_____/8K

Name:_____

Evaluate for x = -2 and y= -3 (½ K each)

16. $4x - 3y$

17. $x - y$

18. $x^2 - y^2$

19. $3xy - 2x + 3y$

20. The temperature in Caledonia at noon was -4 ^{0}C and fell to -13 ^{0}C by midnight. What was the change in temperature? (1 K)

Notes:

SIGN RULES for Multiplication and Division:

HOW DO SIGNS WORK FOR ADDITION AND SUBTRACTION?

WHAT IS BEDMAS? IDENTIFY THE PARTS.

Section B: Rational Numbers

Name: _____

1. Which numbers are rational numbers? (1A) $\sqrt{5}$, 3.14, $1\frac{3}{4}$, 0.6

Write in order from largest to smallest. (1A each)

2. $\frac{-1}{3}$, $\frac{2}{6}$, $\frac{1}{6}$

3. 3.3, $-3\frac{1}{3}$, $\frac{10}{3}$

Write as a fraction in lowest terms. (1A each)

4. 0.62

5. -7.25

Write as a decimal. (1A each)

6. $\frac{13}{7}$

7. $-4\frac{7}{8}$

Calculate. (1A each)

8. $\frac{7}{5} \times \frac{1}{7}$

9. $\frac{1}{2} + \frac{1}{6}$

10. -1.5 - 0.8

11. -3.75 + 11.23

12. 5.5 + 4(3 + 2) ÷ 1.5

13. $(6 - 5)^2 + (8 - 7) \div \frac{1}{2}$

_____/13 A

Name: _____

Simplify. (2A each)

14. $(\frac{7}{2}+\frac{1}{4})\times\frac{1}{2}$

16. $\frac{1}{3}\times\frac{2}{5}\div 2$

15. $\frac{8}{3}-3\times\frac{1}{6}$

17. $3\div\frac{1}{3}\times\frac{1}{27}$

18. *Solve.* (3A)
A swinging pendulum is often used to keep time. The period of a pendulum is defined as the time it takes for a complete swing to and fro. At sea level on the surface of the Earth, the period, T seconds, is given by the formula:

$$T = 2.01\ \sqrt{l}$$

where l is the length of the pendulum in metres. What is the period of a pendulum of length 1m? 2m? 3m? Write each answer to the nearest hundredth of a second.

___ **COMMON DENOMINATOR FOR ADDING AND SUBTRACTING** (not multiplying!)

_____**WHAT YOU DO TO THE BOTTOM, YOU NEED TO DO TO THE TOP**

_____**MULTIPLICATION: JUST DO IT!**

___ **DIVISION RULE: CHANGE SIGN TO MULTIPLY AND FLIP THE SECOND FRACTION**

___ **BEDMAS ORDER OF OPERATIONS**

** REMEMBER TO DO ADDITION & SUBTRACTION
AND **MULTIPLICATION & DIVISION** ***IN THE ORDER THEY OCCUR***

_____/11A

Section C: Statistics Name: _____

1. Sailing These are Stephan's marks on nine sailing tests:

35 86 88 37 90 41 12 89 37

a) Determine the mean, median, and mode of the data. (3A)

Mean: _____

Median:_____

Mode:_____

b) Which of the three measures best represents Stephan's sailing ability? (1A)

2. The Star Wars Club includes 68 Grade nine students, 77 Grade ten students, 41 Grade eleven students, and 25 Grade twelve students. Fill out the chart below and draw a circle graph to illustrate the percentages. (5A)

Grade	# of Students	%	Degree
nine			
ten			
eleven			
twelve			
total		100%	360°

____/9 A

Section D: Exponent Rules

Name:_____

Multiply (1K each)

1. $(-2xy)(-7xy)$

2. $-5m^2(-2mn)$

3. $-3abx(-2a^2b^4y)$

4. $-2s^2t^3(-5s^4t^2)$

Multiply (1K each)

5. $-5x(-7y)(-2z)$

6. $-6xy(-5z^2)(3t^2)$

Simplify (1K each)

7. $(ab^2)^3$

8. $(mn)^3$

9. $(-j^3k^4)^2$

10. $-(s^3t^2)^0$

Simplify (1K each)

11. $(2x^2y^3)^2(x^2y)$

12. $(-3xy)(-2xy)^2$

13. $(2a^4b^3a)(-3ab)(10a^2b^2)$

14. $(10abc)^2(-2a^2bc)$

_____/14 K

Simplify (1K each)

Name: _____

15. $\frac{10x^5 y^3}{5x^3 y^{-1}}$

16. $\frac{-12a^4 b^{-3}}{3a^2 b^{-5}}$

17. $\frac{-9x^4 y^3}{-3x^{-5} y^2}$

18. $\frac{9p^5 q^{15}}{p^2 q^3 r^2}$

_____/4 K

EXPONENT RULES:

MULTIPLICATION RULE:

DIVISION RULE

POWER RULE

POWER OF A PRODUCT RULE

RULE OF ZERO

Section E: Polynomials

Name: _____

Evaluate for x=3 (1A each)

1. $3(x+1) - (x-3)$

2. $2(x+1) + 3(x-2)$

Expand and simplify. (1A each)

3. $4(2x-3y+5)$

4. $-3(x-2) + 2(x+4)$

Simplify (1A each)

5. $(3x^2 + 2x - 3) + (x^2 + x + 1)$

6. $(x^2 + x - 7) - (2x^2 + 3x + 2)$

7. $-2x(3 - x)$

8. $(3x)(5y)$

Divide (1A each)

9. $\frac{20xy}{4x}$

10. $\frac{-32xy}{8y}$

_____/10A

Divide (1A each)

Name: _____

11. $\dfrac{4x-8x^2+12x^3}{4x}$

12. $\dfrac{5x^3-15x^2-10x}{5x}$

13. $\dfrac{-20x^3yz+30x^2y^2z-40xy^3z}{-10xyz}$

14. $\dfrac{8a^3b^2c^3-12a^2b^2c^2+16a^2b^3c}{4a^2b^2}$

16. $\dfrac{25a^3b^3c^5-40a^4b^3c^4+35a^6b^4c^3}{-5a^2b^2c^2}$

15. $\dfrac{30m^3n^5-36m^4n^4-30m^5n^3}{6m^3n^3}$

Explain and Give examples of the following:

LIKE TERMS

DEGREE

CONSTANTS

MONOMIAL

BINOMIAL

TRINOMIAL

_____/6A

Section F: Equations and Inequations

Name:_____

Solve. (1K each)

1. $x - 2 = 10$

2. $a - 3 = 3$

3. $y + 3 = 4$

4. $n + 7 = 10$

5. $7y = 21$

6. $4a = 24$

7. $\frac{x}{2} = 8$

8. $\frac{a}{10} = 5$

Solve. (1T each)

9. $4x + 3x = 5x + 2$

10. $\frac{x}{6} - 2 = \frac{-x}{6} + 1$

11. $6x + 12 = 3x$

12. $\frac{4x}{3} - 3 = \frac{x}{3} + 2$

13. $2(x - 1) - 2 = 11 - 3x$

14. $2(x + 3) - (2x - 5) = 2(x + 1) + 1$

_____/8K _____/6T

Solve. (1T each)

Name: _____

15. $\frac{(x-1)}{2} = \frac{(x+3)}{3}$

16. $\frac{(3n+1)}{2} - \frac{n}{3} = 4$

Solve each inequality and graph the solution on a number line. (1T each)

17. $7x - 3 \geq 5x - 1$ $\quad x \in I$

18. $3x - 2 < 2x - 4$ $\quad x \in R$

19. $3x - 1 > 5x - 3$ $\quad x \in R$

20. $6x - 4 \leq 9x + 5$ $\quad x \in I$

Reverse BEDMAS

Proper Checking Format

Special Inequation Rules

_____/6T

Section G: Word Problems

Name:

Replace the words with symbols. (½ T each)

1. A number is increased by four.

2. A number is divided in half.

3. A number is multiplied by ten.

4. A number is decreased by one-half.

Write an equation for each statement. (½ T each)

5. Three times a number is fifteen.

6. Five more than a number is six.

7. Two times a number is equal to the number increased by 10.

8. A number increased by 2 and then multiplied by 5 is 20.

Solve. (2T)(1C)

9. The sides of a triangle are 3 consecutive numbers. Its perimeter is 54 cm. How long is each side?

Notes:

You usually let "x" equal the <u>smaller</u> number.

_____ /1C _____ /6T

Solve. (2T each)(1C each)

10. One painter paints a room in 1 h. A second paints it in 2 h. How long will they take to paint a room together?

11. A car left Calgary traveling at 80km/h. An hour later, another car also left Calgary traveling at 90 km/h. How long did it take the second car to catch up? (You need to make a **DST chart**)

12. The sum of 2 numbers is 26. Four times the first number plus twice the second is 70. What are the numbers?

_____/6T _____3C

Solve. (2T each)(1C each)

13. Alicia takes a shortcut to school walking across a rectangular field along the diagonal. The field measures 120m by 160m. How much walking distance does Alicia save? **(Which theorem do you need to use?)**

14. A jar contains $13.00 in dimes and quarters. There are 70 coins in the jar. Find the number of quarters and dimes in the jar by making a chart and solving an equation. **(You need $ value.)**

Solve. (2T each)(1C each)

15. The drama production usually has two ticket prices --$9.00 for adults and $6.50 for students. Friday night. A total of 950 people paid $7675.00 to attend. How many students and adults attended the concert? **(Make a chart, include value)**

16. The sum of three numbers is 84. The second number is five more than twice the first, and the third is four more than the second. Find the numbers.

_____/8T _____/4C

17. Write an **equation** to represent each of the following sentences. Do not solve.

a) A number decreased by six is fifteen. _____

b) The sum of a number and 4 is equal to double the number. _____

c) The product of a number and 5 is eight more than the number. _____

Solve. (2T each)(1C each)

18. The length of a rectangle is 2 cm more than seven times the width. The perimeter is 52 cm. Find the dimensions (length & width) of the rectangle.(**Perimeter formula**)

19. Anna is 2 years older than Maureen and three years younger than Philip. If three quarters of Maureen's age added to half of Anna's age equals Phillip's age, how old are they all now?
Hint: Start with letting the variable **x** represent Maureen's age. **(Use a chart.)**

20. The picture of the dog measures 40 cm by 20 cm. The <u>outside</u> perimeter of the frame (dark line) is 152 cm. in length. What is the width of the *border* around the picture?

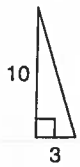
_____/8T _____/3C

Pythagorean Theorem Name_____

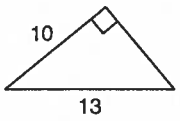
Find the missing side (show your work)

Find each missing length to the nearest tenth.

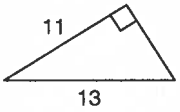
1)



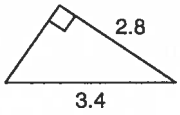
2)



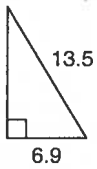
3)



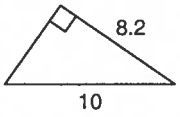
4)



5)



6)



Do the following lengths form a right triangle?

7) $a = 6.4,\ b = 12,\ c = 13.6$