Name: _____ Date: _____ Period_____

Unit #1 Study Guide #1

Use the following to review for you test. Work the Practice Problems on a separate sheet of paper.

What you need to know & be able to do	Things to remember	Examples	KAPbdcM
		1. Convert 6 liters to quarts. $6\,L * \frac{1.05\,q}{1\,L} = 6.3\,q$	2. A bowl of cereal weighs 60 oz. How heavy is that in kg? $60\,oz * \frac{1\,lb}{16\,oz} * \frac{.454}{1\,lb} =$ $\boxed{1.7025\,kg}$
	• There are 5280 feet in one mile • There are 0.034 ounces in one milliliter • There are 0.454 kg in one pound • There are 1.6 kilometers in one mile • There are 1.05 quarts in one liter • There are 4 quarts in one gallon • There are 16 ounces in a pound. • 1 gallon = 3.785 liters	3. Convert 35 miles per hour into feet per second. $\frac{35\,miles}{1\,hr} * \frac{5280\,ft}{1\,Mile} * \frac{1\,hr}{3600\,sec}$ $\boxed{51.3\,ft\,per\,sec}$	4. Water is about 8.4 pounds per gallon. How much is that in grams per liter? $\frac{8.4\,lbs}{1\,gal} * \frac{.454\,kg}{1\,lbs} * \frac{1000\,g}{1\,kg} * \frac{1\,gal}{3.785\,L}$ $\boxed{1007.56}$
Writing and interpreting algebraic expressions	• # of terms • Coefficients • Factors • Constants	5. How many terms are in the expression $-12x^3 + 7x^2 - 4x - 19$? 4 How many terms are in the ***simplified*** expression $5x^2 - 3x + 4 + 6x - 5$? $5x^2 + 3x - 1$ 3	6. a. What are the coefficients, and constants in the expression $20x^4 - 11x + 3$? Coefficients: 20, -11 Constants: 3 b. write an expression to represent the total cost of 20 fair tickets with a 30% discount $.30(20x) = 6x$ c.4 less than 5 times a number $5x - 4$ d. the total cost of purchasing 4 t-shirts on-line for x dollars each with a $7 shipping fee. $4x + 7$

Adding, subtracting and multiplying polynomials	• When adding, just combine like terms. Exponents stay the same; only add coefficients. • When subtracting, distribute the negative then combine like terms. • Distributive property; add exponents; simplify completely	7. Simplify a. $(3x + 2) + (x - 4)$ $\boxed{4x-2}$ b. $(3x + 2) - (x - 4)$ $3x+2-x+4$ $\boxed{2x+6}$ c. $(3x^3-5x^2+7x-1)-(-2x^3+4x^2-8)$ *distribute the negative and WRITE OUT the new problem. $3x^3-5x^2+7x-1+2x^3-4x^2+8$ $\boxed{5x^3-9x^2+7x+7}$ d. $(9x + 4) - (2x^2 - 7x + 1)$ $9x+4-2x^2+7x-1$ $\boxed{-2x^2+16x+3}$	8. Simplify a. $5x^2(3x + 6)$ $15x^3+30x^2$ b. $(6x + 2)(2x - 1)$ $12x^2-6x+4x-2$ $\boxed{12x^2-2x-2}$ c. $(3x + 4)^2$ $9x^2+12x+12x+16$ $\boxed{9x^2+24x+16}$ d. $(2x + 3)(2x - 3)$ $4x^2-6x+6x-9$ $\boxed{4x^2-9}$ e. $(x - 4)(3x^2 - 6x + 9)$ $3x^3-6x^2+9x-12x^2+24x-36$ $3x^3-18x^2+33x-36$
Perimeter, area, and volume using polynomials	Perimeter: add all sides (combine like terms) Area of rectangle: multiply length times width Volume of rectangular prism: multiply l x w x h	11. a. Write an expression for the perimeter of a rectangle whose length is x + 7 and whose width is 2x – 3. $2(x+7)+2(2x-3)$ $2x+14+4x-6$ $\boxed{6x+12}$ b. find the area of the above rectangle. $(x+7)(2x-3)$ $2x^2-3x+14x-21$ $\boxed{2x^2+11x-24}$	12. Write an expression representing the volume of the rectangular prism whose length is 2x + 4, width is x, and height is x-3. $x(2x+4)(x-3)$ $2x^2+4x(x-3)$ $2x^3-6x^2+4x^2-12x$ $\boxed{2x^3-2x^2-12x}$
Radicals	• Simplify • Add/subtract • Multiply • Rationalize denominator	13. simplify completely a. $5\sqrt{27}$ $15\sqrt{3}$ b. $3\sqrt{24} - \sqrt{6}$ $12\sqrt{6}-\sqrt{6}$ $11\sqrt{6}$	14. simplify completely a. $4\sqrt{12}\cdot 2\sqrt{3}$ $8\sqrt{36}$ $\boxed{48}$ b. $2\sqrt{45}\cdot 2\sqrt{50}$ $\boxed{60\sqrt{10}}$ $9\ 5$ $25\ 2$ $6\sqrt{5}\cdot 10\sqrt{2}$ c. $(3+\sqrt{5})(2+\sqrt{5})$ $6+3\sqrt{5}+2\sqrt{5}+\sqrt{25}$ $\boxed{11+5\sqrt{5}}$ d. $\frac{4\sqrt{3}\cdot\sqrt{6}}{\sqrt{6}\cdot\sqrt{6}}$ $\frac{4\sqrt{18}}{\sqrt{36}}=\frac{12\sqrt{2}}{6}=\boxed{2\sqrt{2}}$
rational and irrational numbers	-rational #s can be written as fractions. -Irrational #s are non terminating and non-repeating. -Square roots of non-perfect squares are irrational	15. rational or irrational? a. $5\sqrt{27}$ I : $15\sqrt{3}$ b. 3.14 R c. $-\frac{2}{3}$ R d. Irrational + irrational = I	e. π I f. $400+\sqrt{121}$ $400+11=R$ g. $2\sqrt{98}\cdot\sqrt{2}$ $14\sqrt{2}\cdot\sqrt{2}=R$ h. $(3+\sqrt{5})(3-\sqrt{5})$ R $9-3\sqrt{5}+3\sqrt{5}-25$ i. (rational)(irrational) = I j. sum of rational and irr' = I