

Learning Objectives for March 14 and 16 Test

- 1) Measurement
 - a) Properly measure lengths, volumes, and weights.
 - b) Estimate the final digit of a measurement that is not marked.
- 2) Statistics
 - a) Mean, Median, Mode, Maximum, Minimum, Range
 - i) Calculate Mean – add up data and divide.
 - ii) Calculate Median
 - (1) Find middle number
 - (2) If even number of data points, average two middle numbers
 - iii) Calculate Mode – find most common data points.
 - iv) Calculate $Range = Maximum - Minimum$
 - b) Interpret Box and Whisker Plot
 - i) Find maximum, minimum, median, 1st quartile, 3rd quartile
 - ii) Define maximum, minimum, median, 1st quartile, 3rd quartile
 - c) Create and interpret histograms.
 - i) Properly label axes and title histograms.
 - ii) Create even “bins” and plot the frequency of data points falling in those bins.
 - d) Interpret other graphs – line, frequency dot, pie
- 3) Conversion
 - a) Given a conversion factor convert between units by crossing out.
 - b) Determine the “better buy” by using unit rate.
 - c) Determine the “better buy” by converting between units (ex. convert \$/lb. to \$/kg).
- 4) Order of Operations
 - a) PEMDAS
- 5) Integer arithmetic.
 - a) Define integer as whole numbers and opposites.
 - b) Add integers.
 - i) When signs are opposite, subtract and take the sign of larger number.
 - ii) When signs are same, add and retain the sign.
 - c) Subtract integers.
 - i) Treat all subtraction problems as addition of opposite – BAM, BAM!
 - d) Multiply integers
 - i) $++ = +$
 - ii) $+- = -$
 - iii) $-- = +$
 - e) Divide integers
 - i) $++ = +$
 - ii) $+- = -$
 - iii) $-+ = -$
 - iv) $-- = +$
- 6) Distributive property
 - a) Use distributive property for mental math. Ex. $3 * 51 = 3(50 + 1) = 153$

- b) Distribute with variables.
 - (1) Distributive property of multiplication over addition: $5(x + 4) = 5x + 20$.
 - ii) Distributive property of multiplication over subtraction: $5(x - 4) = 5x - 20$.
- 7) Combining like terms
 - a) Identify terms, coefficients, variables, and constants.
 - b) Identify like terms.
 - i) Like terms have same variable.
 - (1) $5t$ and $-7t$ are like terms
 - (2) $5u$ and $-7t$ are NOT like terms.
 - ii) Variable of like terms have same exponent.
 - (1) $-2a^3$ and $14a^3$ are like terms.
 - (2) $5n^2$ and $5n$ are NOT like terms.
 - c) Only like terms can be added or subtracted.
 - d) Any terms (like or not) may be multiplied or divided as in distributive property.
- 8) Solve for variable with addition or subtraction
 - a) Train tracks
 - b) Use inverse operation
 - i) Subtraction is inverse of addition
 - ii) Addition is inverse of subtraction
 - c) Check solution by substituting answer back in.
- 9) Solve for variable with multiplication and division.
 - a) Division is inverse operation of multiplication.
 - b) Multiplication is inverse operation of division.
 - c) Check solution.
- 10) Solve 2-step equations.
 - a) Work outside in or reverse of PEMDAS.
 - b) Check solution.
- 11) Solve multi-step equations.
 - a) Distribute.
 - b) Combine like terms.
 - c) Isolate variable (get the variable alone).
 - d) Solve.
 - e) Check solution.
- 12) Write equations from word sentences and solve.
 - a) Example: If Sally picked 6 pints of strawberries and there are 9 strawberries per quart, how many strawberries did she pick?
 - b) Define variable (example: $x = \text{\#of strawberries}$)
 - c) Determine what everything is equal to. (example: The total number of strawberries = x)
 - d) Determine the operations that apply. (example: $6 \text{ pints} * 9 \text{ strawberries/pint}$)
 - e) Put it in an equation and solve. (example: $6 \text{ pints} * 9 \text{ strawberries/pint} = x \text{ strawberries}$.)

- 13) Write inequalities from words and from graphs.
- 14) Graph inequalities.
- a) Open circle for $>$ and $<$.
 - b) Closed circle for \geq and \leq .
- 15) Solve one-step inequalities using addition and subtraction and graph.
- 16) Set up and solve proportions.
- a) Set up tic tac toe.
 - b) Scale objects.
 - c) Cross multiply.
 - d) Solve algebraically.
- 17) Fractions
- a) Equivalent fractions.
 - i) Identify fractions that are equivalent.
 - ii) Recognize that proportions are equivalent fractions.
 - b) Multiply fractions.
 - i) Cross cancel early and often.
 - ii) Multiply across numerator and denominator.
 - iii) Simplify at end if possible.
 - c) Divide fractions.
 - i) Dividing fractions is multiplying by reciprocal (Copy dot flip-flop)
 - ii) After setting up as a multiplication problem, then simplify early and often.
 - iii) Multiply across numerator and denominator.
 - iv) Simplify at end if possible.
- 18) Exponent Rules
- a) Identify coefficient, base, and exponent.
 - b) Multiplication
 - i) Multiply coefficients.
 - ii) Add exponents of same bases.
 - c) Division
 - i) Divide coefficients.
 - ii) Subtract exponents of same bases.
 - d) Any number of variable raised to 0 power is 1.
 - e) Negative exponents – make positive by placing that base and exponent on other side of fraction bar.
- 19) Scientific Notation
- a) Coefficient is between 1 and 10
 - b) Exponent of 10 moves decimal place
 - i) To the right if positive.
 - ii) To the left if negative.
 - c) Multiplying scientific notation
 - i) Multiply coefficients.
 - ii) Add exponents of 10.
 - d) Dividing scientific notation
 - i) Divide coefficients.
 - ii) Subtract exponents of 10.

20) Fractions

- a) Multiply fractions
 - i) Convert all fractions to mixed numbers.
 - ii) Simplify early and often
 - iii) Multiply numerators and denominators
 - iv) Simplify again if possible.
- b) Divide fractions
 - i) Convert all mixed numbers to improper fractions
 - ii) COPY-DOT-FLIP FLOP
 - iii) THEN simplify (cannot simplify before take reciprocal of divisor)
 - iv) Simplify
 - v) Multiply numerators and denominators.
 - vi) Simplify again if possible.
- c) Add fractions
 - i) Find a common denominator
 - ii) Add numerators and keep denominator.
 - iii) If Mixed numbers, add integers and then fractions – if fractions are more than one, convert.
- d) Subtract fractions
 - i) Find a common denominator
 - ii) Subtract numerators and keep denominator.
- e) If Mixed numbers, subtract integers and then fractions – may need to borrow.

21) Solving equations with fractions

- a) Variable multiplied by fraction.
 - i) Draw railroad tracks.
 - ii) Multiply both sides by reciprocal.
- b) Variable and fraction added or subtracted.
 - i) Draw railroad tracks.
 - ii) Add or subtract fraction as appropriate, making sure you have a common denominator.

22) Percent

- a) Convert between decimal and percent
 - i) From decimal to percent move to decimal places to the **right**.
 - ii) From percent to decimal move to decimal places to the **left**.
- b) Convert between fraction and percent
 - i) From percent to fraction divide by 100 and simplify.
 - ii) From fraction to percent carry out division and convert resulting decimal to percent.
- c) Percent of something
 - i) Using percent equation
 - (1) Identify percent, base, and amount
 - (2) Substitute into $\% \times \text{base} = \text{amount}$ and solve.
 - ii) Using proportion
 - (1) Identify percent, base, and amount
 - (2) $\frac{\%}{100} = \frac{\text{amount}}{\text{base}}$ and solve.

- iii) Discount and Markup
 - (1) Discount
 - (a) Take percent of original price and find amount.
 - (b) Subtract amount from original.
 - (2) Markup
 - (a) Take percent of original price and find amount.
 - (b) Add amount to original.
- 23) Be able to define and apply:
 - a) APR
 - b) Credit card
 - c) Debit card
 - d) Compound interest
 - e) Simple interest
 - f) Principal
 - g) Bond
 - h) Stock
- 24) Calculate simple and compound interest (formula will be provided).
- 25) Determine **when** to calculate simple and compound interest.
- 26) Know and apply Pythagorean Theorem
- 27) Simplify radicals.