St. John Summer Math Packet 2014

Incoming 8th Grade

Complete this packet throughout your summer vacation. I recommend giving yourself a couple of weeks before starting it, but this packet will help keep your memory fresh on all that you learned in 7th grade.

This packet is NOT mandatory, but it is **HIGHLY RECOMMENDED** in order to be prepared for 8th grade.

If you submit your packet to Mrs. Catalan during the FIRST WEEK OF SCHOOL, I will give you a reward for completing it. =)

Please feel free to do more practice on your own with websites such as: <http://www.softschools.com/grades/6th_and_7th.jsp>

Have a wonderful summer!

Blessings,

Ms. Hansen



To add and subtract decimals, make sure the decimal points are lined up. Add zeros after the decimal point when needed.

EX: $67.21-49.372$ $ 67.210$

 $-49.372$

 17.838

**1.** $22.9+13.85$ **2.** $5.92-4.38$ **3.** $2.1-1.9$

**ANS: 36.75 ANS: 1.54 ANS: 0.2**

**4.** $17.56-3.42$ **5.**  $3.1+0.789$ **6.** $41.24+9.273$

**ANS: 14.14 ANS: 3.889 ANS: 50.513**

To multiply decimals, multiply as normal and then count how many decimal places your factors have. That is how many decimal places your answer needs to have.

EX: $3.65 × 2.1$ $365$ \*3.65 has 2 decimal places and 2.1 has one =

 $ × 21$ total of 3 decimal places in the answer.

 365

 +7300

 7665 7.665 as final answer

**7.** $52.33 × 4.5$ **8.** $1.924 × 7.2$ **9.** $3.456 × 2.82$

**ANS: 235.485 ANS: 13.8528 ANS: 9.74592**

To divide decimals, make sure your divisor is a whole number. If it isn’t, move the decimal point the number of places necessary. You then must also move the decimal point in the dividend the same number of places.

EX: $6.24 ÷ 3$ EX: $4.267 ÷ 0.05$

**10.** $95.04÷22$ **11.** $226÷8$ **12.** $36÷0.8$

**ANS: 4.32 ANS: 28.25 ANS: 45**

**13.** $14.35÷0.41$

**ANS: 35**

**14.** You and your 5 friends by a pizza to share. The pizza costs $15.90. How much money should you each pay for the pizza?

**ANS: You should each pay $2.65**

**15.** At the grocery store you buy everything you need to bake a cake. You gave the cashier $20.00 and got $4.31 back in change. How much did your groceries cost?

**ANS: Your groceries cost $15.69**

To add and subtract fractions and mixed numbers, you need to have a common denominator. With mixed numbers, if you are unable to subtract the fractions you must regroup from the whole number. Always put your answer in simplest form.

EX: $\frac{7}{8}-\frac{3}{8}$ EX: $3\frac{1}{7}-1\frac{1}{3}$

**16.** $\frac{4}{15}+\frac{8}{15}$ **17.** $6\frac{7}{9}+3\frac{5}{12}$ **18.** $\frac{7}{10}-\frac{1}{6}$

**ANS:** $\frac{4}{5}$ **ANS:** $10\frac{7}{36}$ **ANS:** $\frac{8}{15}$

**19.** $8\frac{2}{7}-1\frac{5}{14}$ **20.** $4\frac{5}{12}-2\frac{1}{12}$ **21.** $\frac{3}{8}+\frac{19}{None}$

**ANS:** $6\frac{13}{14}$ **ANS:** $2\frac{1}{3}$ **ANS:** $1\frac{1}{6}$

To multiply fractions, multiply the numerators and multiply the denominators. \*Remember the song!\* You may also cross cancel. Make sure your answer is in simplest form.

To multiply mixed numbers, change them to improper fractions, then follow the multiplication of fractions rules. Make sure your answer is in simplest form, which may mean changing it back to a mixed number.

EX: $\frac{3}{8}×\frac{2}{5}$ EX: $3\frac{1}{3}× 4\frac{1}{2}$

**22.** $\frac{5}{9}×\frac{3}{5}$ **23.** $\frac{3}{7}∙\frac{4}{9}$ **24.** $2\frac{1}{9}× 1\frac{1}{2}$

**ANS:** $\frac{1}{3}$ **ANS:** $\frac{4}{21}$ **ANS:** $3\frac{1}{6}$

**25.** $6∙\frac{8}{21}$ **26.** $5∙2\frac{2}{5}$ **27.** $3\frac{5}{6}× 4\frac{2}{3}$

**ANS:** $2\frac{2}{7}$ **ANS:** $12$ **ANS:** $17\frac{8}{9}$

To divide fractions, multiply the first fraction by the reciprocal of the second fraction. \*Remember the song!\* Don’t forget to put your answer in simplest form.

To divide mixed numbers, change to improper fractions and follow the division of fractions rules.

EX: $\frac{2}{3}÷\frac{8}{9}$ EX: $2\frac{1}{3}÷1\frac{3}{4}$

**28.** $\frac{1}{9}÷\frac{3}{5}$ **29.** $5÷\frac{10}{11}$ **30.** $\frac{3}{5}÷\frac{6}{7}$

**ANS:** $\frac{5}{27}$ **ANS:** $5\frac{1}{2}$ **ANS:** $\frac{7}{10}$

**31.** $2\frac{3}{7}÷3\frac{1}{2}$ **32.** $5\frac{1}{4}÷5\frac{1}{3}$

**ANS:** $\frac{34}{49}$ **ANS:** $\frac{63}{64}$

**33.** A stack of books is 36 inches high. If each book is $\frac{3}{4}$ in. thick, how many books are stacked together?

**ANS: There are 48 books.**

**34.** Silvia buys $1\frac{2}{3}$ yd. of blue fabric and $2\frac{4}{5}$ yd. of purple fabric. How many total yards of fabric does Silvia buy?

To simplify expressions, follow the rules of PEMDAS. Remember: a fraction bar acts like parentheses: you must simplify the numerator and denominator first before simplifying the rational value.

EX: $\left(2^{3}-5\right)-(2∙5-8)$

**ANS: Silvia buys 1**$\frac{7}{15}$ **yd. of fabric in all.**

**35.** $ 2\left[\left(13-4\right)+2(2)\right]$ 3**6.** $5\left(6+1\right)-3∙3$

**ANS: 26 ANS: 26**

**37.** $ 3+16÷4∙2-1$ **38.** $\frac{2(2^{3}-3)}{6-3+2}$

**ANS: 10 ANS: 2**

Add, subtract, multiply, and divide integers

\*Remember: when subtracting integers, you add the opposite.

\*Remember: when multiplying and dividing integers, if both numbers are the same sign the answer is positive; different signs gives a negative answer.

EX: $-3+4=1$ EX: $-2-3=-2+\left(-3\right)=-5$ EX: $-4\left(5\right)=-20$

**39.** $-3+8$ **40.** $-3+(-6)$ **41.** $7+(-13)$

**ANS: 5 ANS:** $-9$ **ANS:** $-6$

**42.** $-11-21$ **43.** $3-10$ **44.** $10-(-4)$

**ANS:** $-32$ **ANS:** $-7$ **ANS: 14**

**45.** $-3(4)$ **46.** $\frac{-15}{-3}$ **47.** $-6(-7)$

**ANS:** $-12$ **ANS: 5 ANS: 42**

Writing expressions: use a variable for what you do not know. Always translate left to right. \*Remember: when you see “less than” it means you switch the order.

EX: Two less than a number => $x-2$ EX: Two less a number => $2-x$

**48.** The sum of a number and three **49.** The product of six and a number

**ANS:** $x+3$ **ANS:** $6x$

**50.** Seven less than a number

**ANS:** $x-7$

Solving equations: The goal is to figure out what the variable needs to be in order to make the equation true. Use the opposite operation to solve for the variable.

EX: $x-9=20$ EX: $-3x=21$ EX: $2x+4=-8$

**51.** $x+3=-7$ **52.** $-2x=16$ **53.** $x-3=-1$

**ANS:** $x=-10$ **ANS:** $x=-8$ **ANS:** $x=2$

**54.** $-5x=-35$ **55.** $x-9=-9$ **56.** $x+8=3$

**ANS:** $x=7$ **ANS:** $x=0$ **ANS:** $x=-5$

**57.** $ \frac{x}{-9}=-3$ **58.** $ 4x-18=-34$ **59.** $ \frac{x}{-5}+1=-7$

**ANS:** $x=27$ **ANS:** $x=-4$ **ANS:** $x=40$

Solving and graphing inequalities: solve as you would an equation.

Graphing: less than or greater than = open circle; less than or equal to/greater than or equal to = closed circle. \*Remember: dividing by a negative switches the inequality.

EX: $x<3$ EX: $-2x-4\geq -2$

**60.** $x>5$ **61.** $x-3\leq -1$ **62.** $-3x+4<9$

 **ANS:** $x\leq 2$ **ANS:** $x>-1\frac{2}{3}$

  

Simplifying expressions: use the distributive property if necessary, and combine like terms.

EX: $-4\left(x+3\right)-6x+7$

**63.** $-5x+13+3x$ **64.** $6\left(x-3\right)-10x$ **65.** $4-2\left(x-1\right)+8x$

**ANS:** $-2x+13$ **ANS:** $-4x-18$ **ANS:** $6x+6$

Solving complex equations: you can have one solution, no solution, or infinitely many. To get no solution, your answer should be a contradiction. To get infinitely many, your equation should have the same value on both sides (i.e. 4=4)

\*Simplify everything you can, and then get the variable alone. Remember, you may need to move variables so that they are on the same side of the equal sign.

EX: $-3x+4-2x=-5(x+4)$

**66.** $ 11+5x=8x-4$ **67.** $-3\left(x+1\right)=2x+7$

**ANS:** $x=5$ **ANS:** $x=-2$

**68.** $2\left(6x-4\right)=3\left(4x-3\right)+1$ **69.** $7\left(x-2\right)=5(x+2)$

**ANS: all real numbers ANS:** $x=12$

**70.** $6+6\left(2x-1\right)=3-2x+14x$ **71.** $-4\left(x+3\right)=2x$

**ANS: no solution ANS:** $x=-2$

**72.** Every student needs exactly 4 pencils. If the teacher only has 72 pencils to give out to students, how many students will have the 4 pencils they need?

**ANS: 18 students will have the 4 pencils they need.**

**73.** Becca is $x$ years old. Ann is two years older than Becca. Together, their ages add to 48. How old is Ann?

**ANS: Ann is 25 years old.**

Rates, Ratios, Proportions, Scale

\*Use your unit rates to convert rates

\*Set up a proportion to compare a drawing/model with something in real life

\*Round to the nearest tenth

EX: 7 qt/min = \_\_?­­\_\_ gal/hr

**74.** 18 mi/hr = \_\_?­­\_\_ ft/s **75.** 4 c/min = \_\_?­­\_\_ qt/hr

**ANS: 26.4 ft/s ANS: 60 qt/hr**

**76.** If you can run 68 meters in 15 seconds, how fast are you running per meter?

**ANS: You are running approximately 0.2 seconds per meter.**

**77.** The scale of a model of a roller coaster is 1 in. = 30 ft. If the actual height of the roller coaster is 240 ft., how tall is the model of the roller coaster?

**ANS: The model of the roller coaster is 8 in.**

**78.** You want to buy a bag of candy to share with your classmates, because you love them. At Walmart, you can buy an 10-oz bag of candy for $2.48. At Target, you can buy a 12-oz bag for $2.76. You’re pretty thrifty, and like to save money whenever you can. Which store should you buy the candy from?

**ANS: The bag at Walmart costs approximately $0.25 per oz, and the bag at Target costs approximately $0.23 per oz, so you should buy the candy at Target.**

Fractions, decimals, and percents

Fractions to decimals: use long division

Fractions to percents: create an equivalent fraction with a denominator of 100 (since percents are out of 100), and the numerator is the percent

Decimals to fractions: the decimal place tells you what the denominator is

Decimals to percents: move the decimal point to the right two places (multiply by 100)

Percents to fractions: write the percent out of 100 and simplify

Percents to decimals: move the decimal point to the left two places (divide by 100)

Percent Proportion: set up your ratios by figuring out what you have (part, whole, percent); use a variable for what you do not know.

EX: Write 0.24 as a fraction and percent EX: What is 20% of 40?

For problems 79-81, write each fraction as a percent and decimal.

**79.** $\frac{3}{5}$ **80.** $\frac{7}{10}$ **81.** $\frac{3}{4}$

**ANS: 0.6; 60% ANS: 0.7; 70% ANS: 0.75; 75%**

For problems 82-84, write each percent as a fraction in simplest form and a decimal.

**82.** 65% **83.** 28% **84.** 76%

**ANS:** $\frac{13}{20}$**; 0.65 ANS:** $\frac{7}{25}$**; 0.28 ANS:** $\frac{19}{25}$**; 0.76**

For problems 85-87, write each decimal as a percent and fraction in simplest form.

**85.** 0.52 **86.** 0.98 **87.** 0.27

**ANS:** $\frac{13}{25}$**; 52% ANS:** $\frac{49}{50}$**; 98% ANS:** $\frac{27}{100}$**; 27%**

**88.** 72 is what percent of 160? **89.** 27 is 90% of what number?

**ANS: 45% ANS: 30**

**90.** If 28 of the 50 soup cans on a shelf are chicken noodle soup, what percent of the cans are chicken noodle soup?

**ANS: 56% of the cans are chicken noodle soup.**

**91.** You buy your favorite pair of jeans for 40% off the regular price of $95. What is the sale price of your jeans? If sales tax is 9%, what is the total amount you will pay for your jeans?

**ANS: Sales price: $57. Total amount with tax: $62.13**

Area and Perimeter

Perimeter = distance around a polygon

Area of Triangle: $\frac{1}{2}bh$

Area of Rectangle/square: $bh$

Volume of Rectangular Prism: $l∙w∙h$

**92.** Find the **area** and **perimeter** of the **93.** Find the **area** of the triangle.

 rectangle.

6 in

4 cm

9 in

5 cm

**ANS: Area: 20** $cm^{2}$ **ANS: Area: 27** $in^{2}$

 **Perimeter: 18** $cm$

**94.** Find the **area** and **perimeter** of the **95.** Find the **area** of the triangle.

 rectangle.

3 in

7 cm

10 in

8 cm

**ANS: Area: 56** $cm^{2}$ **ANS: Area: 15** $in^{2}$

 **Perimeter: 30** $cm$

**96.** Find the **perimeter** and **area** of the irregular figure.

12 cm

4 cm

8 cm

10 cm

**ANS: Perimeter: 40** $cm$**; Area:** $56 cm^{2}$

**97.** What is the **volume** of a cube that has a length of 5 cm?

**ANS:** $125 cm^{3}$

**98.** A rectangle has a width of 4 centimeters and a perimeter of 28 centimeters. Find the length of the rectangle.

**ANS: The length is** $10 cm$