Algebra II / Trig
SUMMER HOMEWORK!!!
2019 – 2020 School Year

1. Please do all work on a **separate sheet of paper**.

2. For each problem, copy the original problem, show all necessary work, and **clearly** label your answer.

3. Keep your work organized and understandable. Make clear divisions between different problem sets.

4. This will be **turned in on the first day** of class (for a grade) and within **the first week there will be a quiz (no calculator)** over the material covered in the summer homework.

Good luck & enjoy your summer!

Problem Set 1: Fraction Operations

Add, subtract, multiply or divide fraction without a calculator. Always reduce fractions.

To add or subtract fractions, you must first find a common denominator:

$$\frac{3}{4}+\frac{1}{3}=\frac{9}{12}+\frac{4}{12}=\frac{13}{12}$$

To multiply fractions, multiply straight across:

$$\frac{1}{3}\cdot\frac{2}{5}=\frac{1\cdot 2}{3\cdot 5}=\frac{2}{15}$$

To divide fractions, multiply by the reciprocal:

$$\frac{2}{5}\div\frac{3}{2}=\frac{2}{5}\cdot\frac{2}{3}=\frac{2\cdot 2}{5\cdot 3}=\frac{4}{15}$$

1) $\frac{3}{4}+\frac{-5}{8}$ 2) $\frac{-7}{12}\div\frac{2}{3}$ 3) $4-\frac{4}{5}$ 4) $\frac{5}{8}\div 8$ 5) $\frac{-1}{4}\bullet 20$

6) $5\div\frac{5}{7}$ 7) $\frac{7}{9}-3$ 8) $\frac{4}{5}-\frac{2}{3}$ 9) $\frac{1}{4}+\frac{2}{3}$ 10) $1\div\frac{3}{4}$

Problem Set 2: Order of Operations

Follow the Order of Operations when evaluating. Remember "please excuse my dear aunt Sally"

P (lease) – parentheses
E (xcuse) – exponents
M (y) D (ear) – multiplication & division (from left to right)
A (unt) S (ally) – addition & subtraction (from left to right)

Example:

$2^3 + 10 \div 5$
$8 + 10 \div 5$
$8 + 2$
10

Evaluate the following expressions.

1) $-7+2^3-9$ 2) $18\div\left[(4-7)+5\right]$ 3) $\frac{3}{4}\bullet 24+4^2-1$ 4) $156-3^2\bullet 5-8^2$

5) $\frac{5+7\bullet 3}{6+7}$ 6) $\frac{2-9}{8-8^2}$ 7) $9(7-2)^2$ 8) $\left[(1-7)^2+4\right]\div 8$

For problems #9 – 16 evaluate the expression when x = -4 and y = 3.

9) $-3x^2$ 10) $xy\div(x+y)$ 11) x^2-x+5 12) $-2x^2+y^2$

13) $-2(x+4y^2)$ 14) $5(2y-x)$ 15) $20-\frac{16}{x}$ 16) $\frac{x+2}{x-2}$

Problem Set 3: Simplifying the Expressions

Simplify. Combine Like Terms.

1) $6x - 9x + x$ 2) $\frac{1}{5}d + \frac{2}{7}d$ 3) $18g^3 + 9g^2 + g^3$ 4) $6h - 3h(h + 1)$

5) $9k - 2(3k - 5) - 10$ 6) $5(r + 1) - (r - 3)$ 7) $x(2x - 6) + x^2$ 8) $2n + 8 + 3n(n - 5)$

Problem Set 4: Word Problems

1) During the month of May, Rosa made deposits of $128.50 and $165.19 into her checking account. She wrote checks for $55.12, $25, and $83.98. If her account balance at the end of May was $327.05, what was her balance at the beginning of May?

2) You make 20 silk flower arrangements and plan to sell them at a craft show. Each flower arrangement cost $12 in materials, and your booth at the craft show cost $30. If you sell the arrangements for $24 each, how many must you sell to make at least $100 profit?

3) A store sells sweatshirts in small, medium, large, and extra large. A customer can choose a long sleeve sweatshirt or sweatshirt with a hood. There are four choices of colors: White, blue, gray, and black. How many different kinds of sweatshirts are available at the store?

4) If 4.26 lb of chicken cost $6.77, what would 3.75 lb of chicken cost?

5) Roger bought some 33¢ stamps and some 20¢ stamps, and spent $4.50. How many of each type of stamp did he buy?

Problem Set 5: Solving

Solve each equation.

Example: Use inverse operations to solve for the variable.

$3y - 5 = -2y + 10$
$5y - 5 = 10$
$5y = 15$
$y = 3$

1) $3y - 4 = 20$ 2) $\frac{x}{7} + 2 = 1$ 3) $7(b - 3) = 8b - 2$ 4) $22d - (6 + 2d) = 4$

5) $\frac{3 + m}{2} = 5$ 6) $104 = \frac{1}{2}\left[(360 - x) - x\right]$ 7) $85 = \frac{1}{2}(226 - x)$

8) $18(x + 18) = 21^2$ 9) $x - (4x + 2) = 13$ 10) $\frac{x + (-2)}{2} = -6$

Problem Set 6: Solving Inequalities

1) $16 + x > 21$

2) $x + \frac{7}{2} \le \frac{11}{2}$

3) $x + 3x > 2x + 6$

4) $(2x-1)+(x+3)>18-x$

5) $(x + 4) + (x + 6) > 3x$

6) $6.2x - 3.7 < -14$

Solving like an equation, unless you multiply or divide by a negative number. **Then you must flip your sign!**

$-3x + 1 > 4$

$-3x > 3$

$x < -1$

Problem Set 7: Solving Absolute Value Equations

1) $|x| = 5$

2) $|x - 2| = -3$

3) $|6 - 3x| = 21$

4) $|2x - 10| = 0$

Remember you must set up two separate equations!

$|x - 4| = 8$

$x - 4 = 8$ $\quad$ $x - 4 = -8$

$x = 12$ $\quad$ $x = -4$

Problem Set 8: Graphing Linear Equations

Use the slope and y – intercept to graph the equation.
Please either put on graph paper or **neatly** draw the graph.

Slope – Intercept Form: y = mx + b
m is the slope and b is the y – intercept
*the y – intercept is the starting point

1) $y = \frac{1}{2}x - 4$

2) $y = x - 3$

3) $2x + 3y = -12$

4) $y - 3x = 4$

5) $x = -2$

6) $y = 3$

7) $y = x$

8) $y = 2x$

Problem Set 9: Writing Equations of Lines from Two Points

Write an equation in slope – intercept form of the line that passes through the given points.

Step 1: find the slope
Step 2: use modified point – slope form to find the line
Step 3: write the equation in slope – intercept form

1) (1, 3) and (7, 4)

2) (0, -3) and (-5, 0)

3) (11, -1) and (-1, -7)

4) (2, 5) and (0, 0)

Given: (2, 4) *and* (8, 7)

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{7 - 4}{8 - 2} = \frac{3}{6} = \frac{1}{2}$$

$$y = \frac{1}{2}(x - 8) + 7$$

$$y = \frac{1}{2}x - 4 + 7$$

$$y = \frac{1}{2}x + 3$$

Problem Set 10: Writing Equations of Lines from Point and Slope

Write an equation in point – slope form of the line that has the given slope and passes through the given point.

Step 1: use modified point – slope form to find the line
Step 2: write the equation in slope – intercept form

Given: $m = -2$ *and* $(8, 7)$
$y = -2(x - 8) + 7$
$y = -2x + 16 + 7$
$y = -2x + 23$

1) m = $\frac{-3}{4}$ and (4, 2) 2) m = -5 and (-1, 6) 3) m = $\frac{1}{2}$ and (10, -4) 4) m = 0 and (3, 1)

Problem Set 11: Writing Equations of Parallel Lines

Step 1: determine the appropriate slope to use (remember parallel lines have the same slope)
Step 2: write the information in to modified point – slope form
Step 3: simplify into slope – intercept form

Given: $y = 2x - 1$ *and* $(-3, 5)$
$m = 2$ *and* $(-3, 5)$
$y = 2(x + 3) + 5$
$y = 2x + 6 + 5$
$y = 2x + 11$

Using the given line, write an equation which is parallel to that and goes through the given point.

1) y = -3x + 1 and (-2, 1) 2) y = $\frac{2}{3}$x – 7 and (2, 1) 3) y = 3x + 4 and (1, -5)

4) y = 3 and (3, 8) 5) x = 4 and (1, 9) 6) y = $\frac{-3}{4}$x – 2 and (4, 1)

Problem Set 12: Word Problems Part Two (Writing Linear Equations and Solving)

1) You are celebrating your older sister's 30th birthday at a restaurant downtown. The restaurant charges $25 per person and $75 to rent the private room. Your parents are only willing to spend $500 for the dinner. How many people can be invited to your sister's birthday dinner?

2) You are starting a lawn mowing business. You charge $20 per lawn and you have already spent $100 in start – up costs for supplies and marketing. If you want to make $750 in profit this summer, how many yards do you need to mow?

3) You buy a car for $6500. The monthly cost of owning the car (including insurance, gas, maintenance, and taxes) averages $350. Write an equation that models the total cost of buying and owning the car.

4) You have a rectangular plot measuring 16 feet by 25 feet. You want to grow tomato plants that each need 8 square feet of space and pepper plants that each need 5 square feet. Write an equation that models how many tomato plants and how many pepper plants you can grow. How many pepper plants can you grow if you grow 15 tomato plants?

5) The balance in Joan's saving account tripled during the year. Joan then withdraw $500, and the resulting balance was $100. What was the balance in the account before it tripled?

6) To purchase a car that costs $3,500, a buyer has to pay, in addition, $250 for insurance and $20 for taxes and fees. If the buyer has $1,800 saved for a car, what amount must be borrowed to be able to buy the car and pay these expenses?

7) A truck sprang a leak at the bottom of its radiator, which held 480 ounces of fluid when it started to leak, and started losing radiator fluid at a constant rate of 4 ounces per minute. Suppose that the radiator continued to leak at this constant rate and that the truck, traveling at 35 miles per hour, could continue traveling at this rate until its radiator was completely empty. In how many miles would the radiator be empty?

8) The July reading of Mr. Corelli's electric meter, in kilowatt – hours (kwh) was 6,278 kwh. On August 1, his electric meter registered 6,328 kwh but was not read by the utility company. Instead, the company estimated that Mr. Corelli has used 60 kwh of electricity during July. If each kwh costs $0.10, what, if any, what the *overcharge* on Mr. Corelli's bill for July, which would be credited to his next bill?