Name:_____

SUMMER MATH PACKET GEOMETRY-2A

The problems in this packet have been selected to help you to review concepts in preparation for your next math class.

Please complete the **odd problems** in this packet.

- Show all your work.

- The work should be done in the booklet itself.

- No calculator for this problem set!

- Give the complete packet to your teacher on the first day of school.

- This will be counted as a graded assignment.

Have a great summer and we look forward to seeing you in September.

Randy Bernstein
Math Chair
Ma'ayanot Yeshiva High School for Girls

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FRACTIONS ADDITION AND SUBTRACTION

Add or Subtract. Reduce to lowest terms.

1) $\frac{5}{9} + \frac{1}{6} =$	2) $3\frac{1}{3} + 2\frac{3}{4} =$
3) $\frac{4}{5} - \frac{3}{20} =$	4) $7\frac{1}{3} - 6\frac{3}{4} =$

FRACTIOB MULTIPLICATIO AND DIVISION

Multiply or Divide. Reduce to lowest terms.

5) $\frac{2}{3} \cdot \frac{1}{7} =$	6) $3\frac{1}{8} \cdot \frac{4}{5} =$
7) $\frac{3}{4} \cdot 16 =$	8) $\frac{3}{7} \div \frac{9}{14} =$
9) $-\frac{7}{12} \div \frac{14}{15} =$	10) $4\frac{1}{3} \div \frac{5}{6} =$

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ALGEBRAIC EXPRESSIONS

Examples:
   A.   Write an expression for seven less than a number.

$$n - 7$$

   B.   Write an equation for three less than six times a number is five times the same number plus 5, then solve.

$$6x - 3 = 5x + 5$$
$$x - 3 = 5$$
$$x = 8$$

Write the expression or equation. Solve the equations.

11) Half of a number plus three times the number.

12) The product of five and a number decreased by seven equals thirteen.

13) Sixteen less than twice a number is 10.

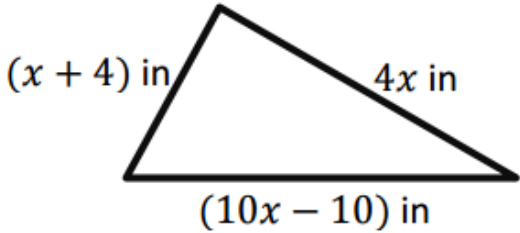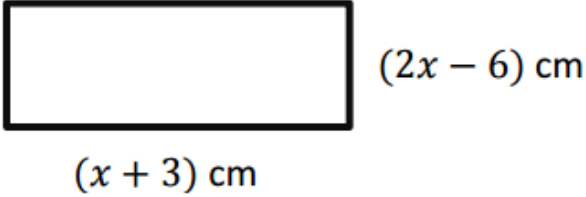14) Twice a number increased by the product of the number and fourteen results in forty-eight.

COMBINING LIKE TERMS

Simplify.

15) $6x + 11y - 4x + y$	16) $-5m + 3q + 4m - q$
17) $-3p - 4t - 5t - 2p$	18) $3x^2 2y - 5xy^2 + 6x^2 y$

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Find the value of x for the triangle or rectangle below.

19) Perimeter = 294 inches	20) Perimeter = 4533 centimeters
$(x + 4)$ in $4x$ in $(10x - 10)$ in	$(x + 3)$ cm $(2x - 6)$ cm

DISTRIBUTIVE PROPERTY

Solve.

21) $-10(y + 8) = 40$	22) $27 = 3c - 3(6 - 2c)$	23) $12y - 5(2y - 7) = -3$

SOLVING EQUATIONS WITH VARIABLES ON BOTH SIDES

Solve the equation.

| 24) $3x + 5 = 2x + 1$	25) $8m + 1 = 7m - 9$	26) $-2t + 10 = -t$

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WRITING AND SIMPLIFYING RATIOS

Write the following ratios.

27) Basmati rice needs to cook for 20 minutes, while quinoa cooks for 25 minutes. What is the ratio of cooking times for rice to quinoa?

28) Jonathan caught 7 fish and John caught 4. What is the ratio of fish caught of Jonathan to John?

Given the rectangles A and B below, answer problems 29 and 30.
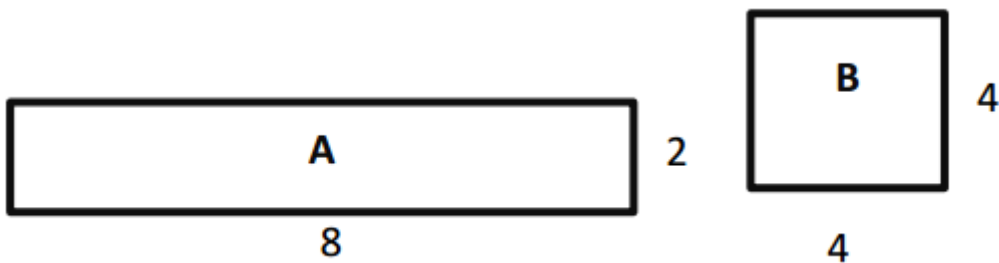
29) What is the ratio of the perimeter of rectangle A to the perimeter of rectangle B?

30) What is the ratio of the area of rectangle A to the area of rectangle B?

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SOLVING PROPORTIONS

Solve.

31) $\dfrac{3}{8} = \dfrac{3}{2d}$	32) $\dfrac{1}{18} = \dfrac{5}{-4(x-1)}$
33) $\dfrac{3w+6}{28} = \dfrac{3}{4}$	34) $\dfrac{3}{m+4} = \dfrac{9}{14}$

PERCENT PROBLEMS

Examples:

Remember: $\dfrac{\%}{100} = \dfrac{part}{whole}$

A. What number is 12% of 75?

$$\frac{12}{100} = \frac{x}{75}$$
$$12 \cdot 75 = 100x$$
$$900 = 100x$$
$$9 = x$$

or

$$\frac{12}{100} = \frac{x}{75}$$
$$(75)\frac{12}{100} = \frac{x}{75}(75)$$
$$(75).12 = x$$
$$9 = x$$

B. 6 is what percent of 40?

$$\frac{x}{100} = \frac{6}{40}$$
$$40x = 6 \cdot 100$$
$$x = 15$$

35) What number is 30% of 120?

36) 200 is what percent of 50?

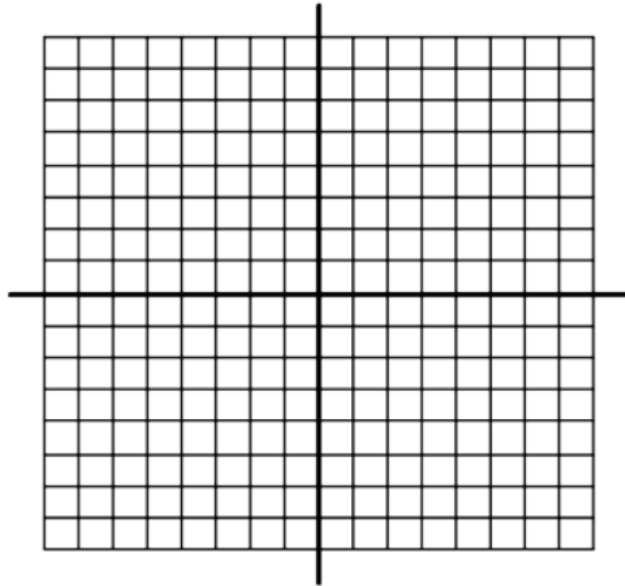37) A $150 leather jacket is going on sale for a 25% discount. How much will the jacket cost on sale?

38) Jim bought 3 CD's at a cost of $14.99 each. What will he pay including 7% sales tax?

PLOTTING POINTS

39) **Plot each of the following points on the grid below. Use the letter to label the point on the graph.**

$$A(3,0)\ B(5,5)\ C(-1,2)\ D(-3,-2)\ E(0,-3)$$

DETERMINING WHETHER A POINT IS ON A LINE

Examples:

Decide whether $(3,-2)$ is a solution of the equation $y = 2x - 8$.

$(-2) = 2(3) - 8$ Substitute 3 for x and -2 for y.

$-2 = -2$ Simplify.

Decide whether the given ordered pair is a solution of the equation. Your answer should say 'Yes a Solution'' or 'Not a Solution'.

40) $y = 6x + 4;\ (-2,8)$	41) $y = -14x - 18;\ (-4,-17)$

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CALCULATING SLOPE

Examples:

Find the slope of a line passing through $(3, -9)$ and $(2, -1)$.

$m = \frac{y_2 - y_1}{x_2 - x_1}$ Formula for slope. Label points: $(3, -9)\ (2, -1)$
                                                                                                      $(x_1, y_1)\ (x_2, y_2)$

$m = \frac{-1-(-9)}{2-3} = \frac{-1+9}{-1} = -8$ Substitute values and simplify.

$m = \frac{8}{-1} = -8$ Slope is -8.
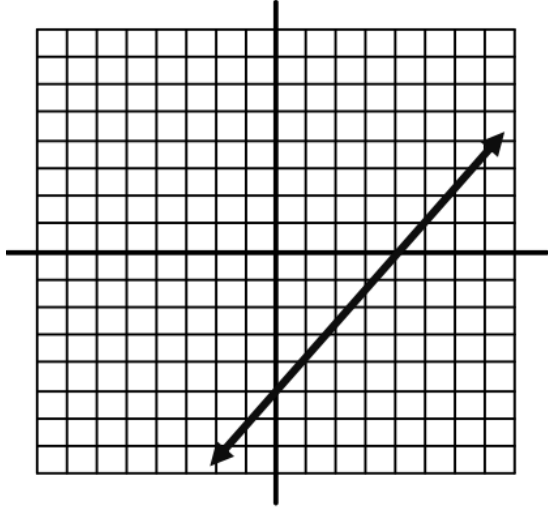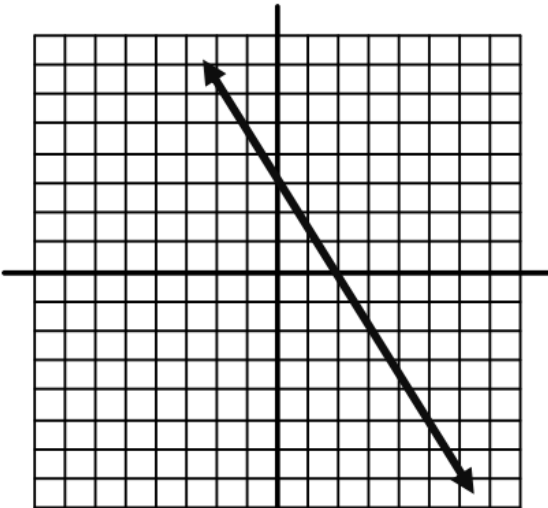
Find the slope of a line that contains the points.

42) $(0, -4), (7, 3)$	43) $(-1, 7), (-3, 18)$	44) $(-6, -4), (1, 10)$

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FINDING THE EQUATION OF A LINE GIVEN SLOPE AND Y-INTERCEPT

Examples:

Find an equation of the line that passes through the point $(3, 4)$ and has a y-intercept of 5.

$y = mx + b$	Write the slope-intercept form where m is slope and b is y-intercept.
$4 = m(3) + 5$	Substitute 5 for b, 3 for x, and 4 for y.
$-1 = 3m$	Subtract 5 from each side.
$-\frac{1}{3} = m$	Divide each side by 3.

The slope is $m = -\frac{1}{3}$. The equation of the line is $y = -\frac{1}{3}x + 5$

Write the equation of the line that passes through the given point and has the given y-intercept.

45) $(7, 0)$; $b = 13$	46) $(-3, -3)$; $b = -2$	47) $(-1, 4)$; $b = -8$

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GIVEN TWO POINTS

Examples:

Write an equation of the line that passes through the points $(4, 8)$ and $(3, 1)$.

$m = \frac{1-8}{3-4}$	Substitute labeled values.	$(4,8) \qquad (3,1)$
$m = \frac{-7}{-1} = 7$	Find the slope of the line.	$(x_1, y_1) \quad (x_2, y_2)$
$1 = 7(3) + b$	Choose one of the points and Substitute values into $y = mx + b$.	
$1 = 21 + b$	Multiply.	
$b = -20$	Solve for b.	

Write an equation of the line that passes through the given points.

48) $(-2, 4), (3, -6)$	49) $(-3, -7), (0, 8)$	50) $(1, 2), (-1, -4)$

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WRITING AN EQUATION OF A LINE FROM A GRAPH

Write the equation of each line.

51)	52)
m = _____ b = _____	m = _____ b = _____
Equation: _____	Equation: _____

GRAPHING EQUATION OF LINE

Find the slope and y-intercept of the equation, and then graph the line

53) $2x + 3y = 6$	54) $y = -\frac{1}{4}x + 2$
Slope: _____ y-intercept _____	Slope: _____ y-intercept _____

PARALLEL AND PERPENDICULAR LINES

55) Find the slope of a line that is parallel to the line $y = -\frac{1}{2}x + 5$.

56) Find the slope of a line that is perpendicular to the line $y = -\frac{1}{2}x + 5$.
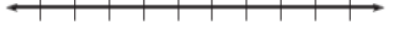
SOLVING INEQUALITIES

Solve the inequality.

57) $c - 18 < 10$	58) $x - 5 \leq 4$	59) $-3x + 4 \geq -5$

SOLVING AND GRAPHING INEQUALITIES

Solve each inequality and graph the solution.

60) $7y - 11 \leq 17$	61) $\frac{t}{4} \geq -1$	62) $11 \leq 6x + 5 \leq 23$

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EXPONENTS

Simplify the expression

63) $(x^{-2})(x^5)$	64) $\frac{1}{x^5}(x^{10})$	65) $\frac{x^3 \cdot x^4}{x^6}$
66) $\frac{10^{12}}{10^4}$	67) $\frac{x^3}{x^{15}}$	68) $(2x^3)\,5$

POLYNOMIAL REVIEW ADDITION AND SUBTRACTION

Simplify.

69) $(3x^2 - 9x + 1) - (2x^2 - 6x + 3)$	70) $(4x^2 - 11x + 1) - (2x^3 - 6x - 10)$

DISTRIBUTION (MULTIPLICATION)

Find the product.

71) $3c^3(8c^4 - c^2 - 3c + 5)$	72) $(4y - 3)(y^2 + 8y - 6)$