

SUMMER ASSIGNMENT FOR INCOMING GEOMETRY STUDENTS

Congratulations on being accepted into the Geometry Program at MEMS. To be successful in Geometry, certain algebra skills are crucial. This summer assignment will help you master writing an equation for a line, solving systems of equations, and factoring polynomials, the skills needed for geometry. The material in this assignment is part of the Algebra 1 class. You will be expected to know these concepts when entering Geometry in September. Please follow the directions below for this assignment.

1. Complete all questions for Linear Equations, Systems of Equations, and Factoring Polynomials.
2. SHOW ALL WORK on the Answer Sheets provided. An answer only is NOT ACCEPTABLE.
3. We will spend time in September going over the concepts we feel most students still need to master and then an assessment will be given that will count as a grade for the first quarter.

Our Geometry Program has been very successful and we want to continue that tradition. We want every student confident and ready for the challenges of accelerated math classes in high school. We are looking forward to making Geometry a positive and challenging class for you.

STUDENT NAME: _____

LINEAR EQUATIONS

Write an equation in slope-intercept form of the line with the given slope and y-intercept.

1. slope: 5
y-intercept: -7

2. slope: $\frac{2}{5}$
y-intercept: -2

3. slope: $-\frac{4}{3}$
y-intercept: 1

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

4. $(-2, -8)$; $m = 3$

5. $(1, 1)$; $m = -4$

6. $(-1, 3)$; $m = -6$

Write an equation in point-slope form of the line that passes through the given points.

7. $(4, 5)$, $(2, 9)$

8. $(-2, 2)$, $(8, -3)$

9. $(3, 4)$, $(1, -6)$

Write an equation in standard form of the line with the given characteristics.

10. Slope: 10; passes through $(6, 2)$

11. Passes through $(-3, 2)$ and $(6, -1)$

Write an equation of the line that passes through the given point and is (a) parallel to the given line and (b) perpendicular to the given line.

12. $(2, 0)$, $y = -5x + 3$

13. $(-1, 4)$, $y = -x - 4$

14. $(4, -9)$, $y = \frac{1}{4}x + 2$

Make a scatter plot of the data. Draw a line of fit. Write an equation of the line.

15.

x	0	1	2	3	4
y	15	35	53	74	94

16.

x	0	2	4	8	10
y	-2	6	15	38	50

17. **FIELD TRIP** Your science class is taking a field trip to an observatory. The cost of a presentation and a tour of the telescope is \$60 for the group plus an additional \$3 per person. Write an equation that gives the total cost C as a function of the number of people p in the group.

18. **GOLF FACILITIES** The table shows the number of golf facilities in the United States during the period 1997–2001.

a. Make a scatter plot of the data where x is the number of years since 1997 and y is the number of golf facilities (in thousands).

b. Write an equation that models the number of golf facilities (in thousands) as a function of the number of years since 1997.

c. At about what rate did the number of golf facilities change during the period 1997–2001?

d. Use the equation from part (b) to predict the number of golf facilities in 2004.

e. Predict the year in which the number of golf facilities reached 16,000. *Explain* how you found your answer.

Year	Golf facilities (thousands)
1997	14.6
1998	14.9
1999	15.2
2000	15.5
2001	15.7

Linear Equations Answer Sheet

Name: _____

1.	2.	3.
4.	5.	6.
7.	8.	9.

10.

11.

12a.

13a.

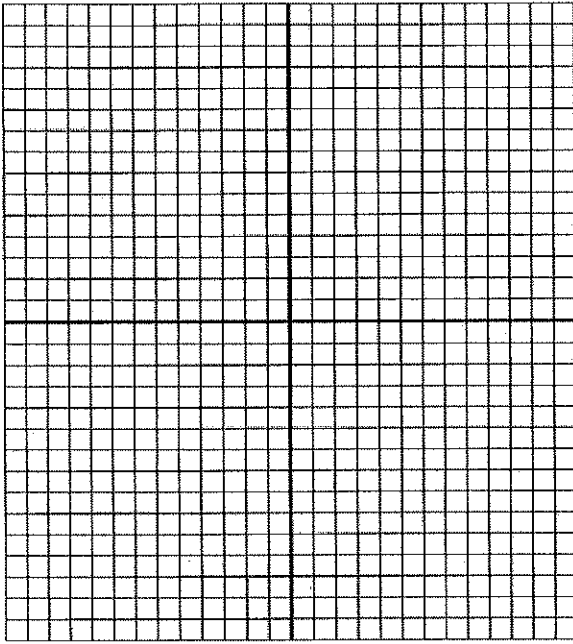
14a.

12b.

13b.

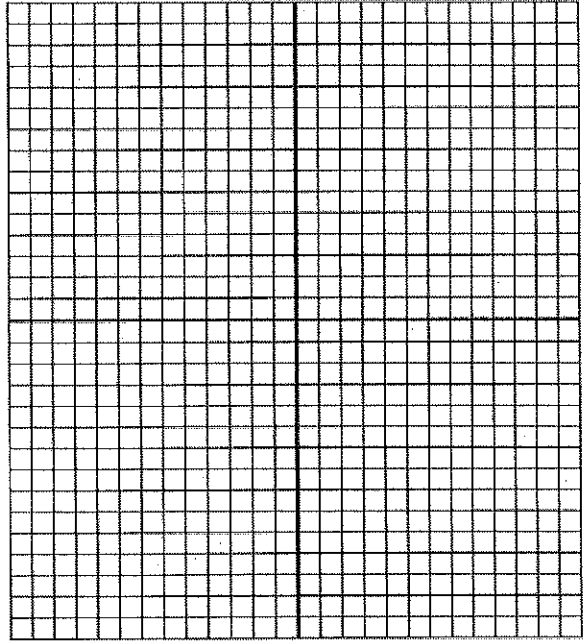
14b.

15.



Equation: _____

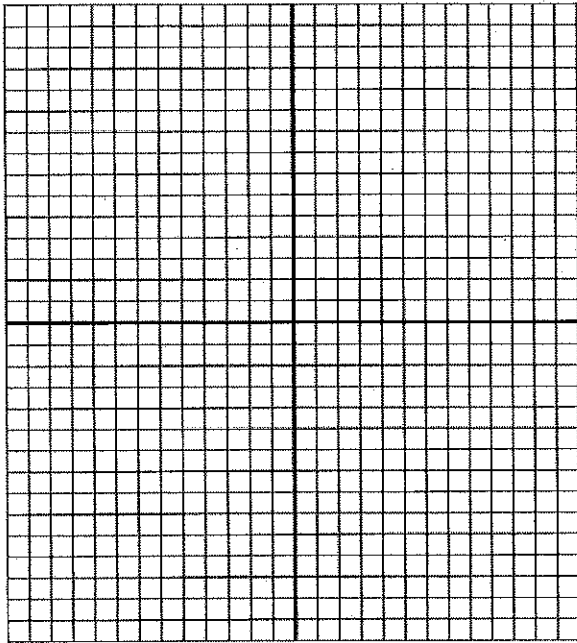
16.



Equation: _____

17.

18. a.



b.

c.

d.

e.

SOLVING SYSTEMS OF EQUATIONS

Solve the linear system by graphing. Check your solution.

1. $3x - y = -6$
 $x + y = 2$

2. $-2x + y = 5$
 $x + y = -1$

3. $y = 4x + 4$
 $3x + 2y = 12$

4. $5x - 4y = 20$
 $x + 2y = 4$

5. $x + 3y = 9$
 $2x - y = 4$

6. $2x + 7y = 14$
 $5x + 7y = -7$

Solve the linear system using substitution.

7. $y = 5x - 7$
 $-4x + y = -1$

8. $x = y - 11$
 $x - 3y = 1$

9. $3x + y = -19$
 $x - y = 7$

10. $15x + y = 70$
 $3x - 2y = -8$

11. $3y + x = 17$
 $x + y = 8$

12. $0.5x + y = 9$
 $1.6x + 0.2y = 13$

Solve the linear system using elimination.

13. $8x + 3y = -9$
 $-8x + y = 29$

14. $x - 5y = -3$
 $3x - 5y = 11$

15. $4x + y = 17$
 $7y = 4x - 9$

16. $3x + 2y = -5$
 $x - y = 10$

17. $3y = x + 5$
 $-3x + 8y = 8$

18. $6x - 5y = 9$
 $9x - 7y = 15$

Tell whether the linear system has *one solution*, *no solution*, or *infinitely many solutions*.

19. $15x - 3y = 12$
 $y = 5x - 4$

20. $4x - y = -4$
 $-8x + 2y = 2$

21. $-12x + 3y = 18$
 $4x + y = -6$

22. $6x - 7y = 5$
 $-12x + 14y = 10$

23. $3x - 4y = 24$
 $3x + 4y = 24$

24. $10x - 2y = 14$
 $15x - 3y = 21$

Graph the system of linear inequalities.

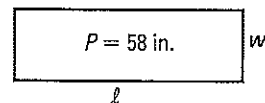
25. $y < 2x + 2$
 $y \geq -x - 1$

26. $y \leq 3x - 2$
 $y > x + 4$

27. $y \leq 3$
 $x > -1$
 $y > 3x - 3$

28. **TRUCK RENTALS** Carrie and Dave each rent the same size moving truck for one day. They pay a fee of x dollars for the truck and y dollars per mile they drive. Carrie drives 150 miles and pays \$215. Dave drives 120 miles and pays \$176. Find the amount of the fee and the cost per mile.

29. **GEOMETRY** The rectangle has a perimeter P of 58 inches. The length l is one more than 3 times the width w . Write and solve a system of linear equations to find the length and width of the rectangle.

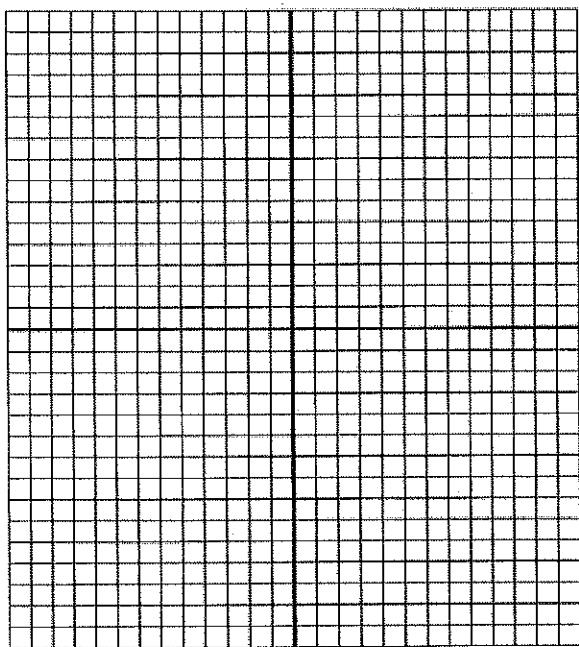


30. **COMMUNITY SERVICE** A town committee has a budget of \$75 to spend on snacks for the volunteers participating in a clean-up day. The committee chairperson decides to purchase granola bars and at least 50 bottles of water. Granola bars cost \$.50 each, and bottles of water cost \$.75 each. Write and graph a system of linear inequalities for the number of bottles of water and the number of granola bars that can be purchased.

SOLVING SYSTEMS OF EQUATIONS ANSWER SHEET

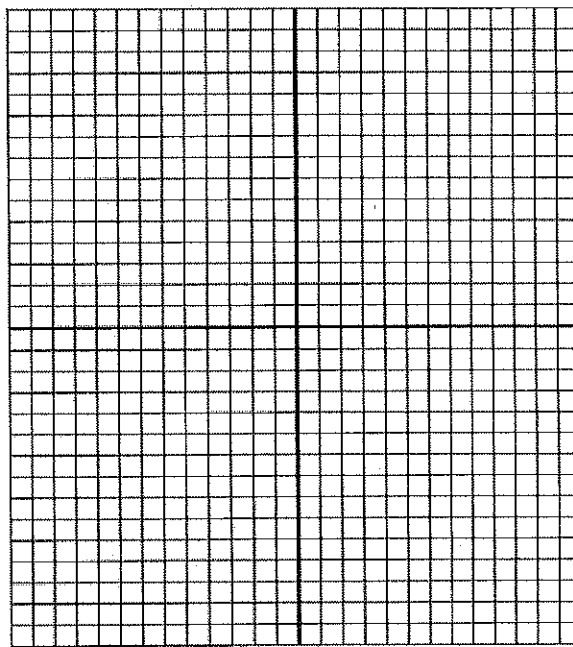
NAME _____

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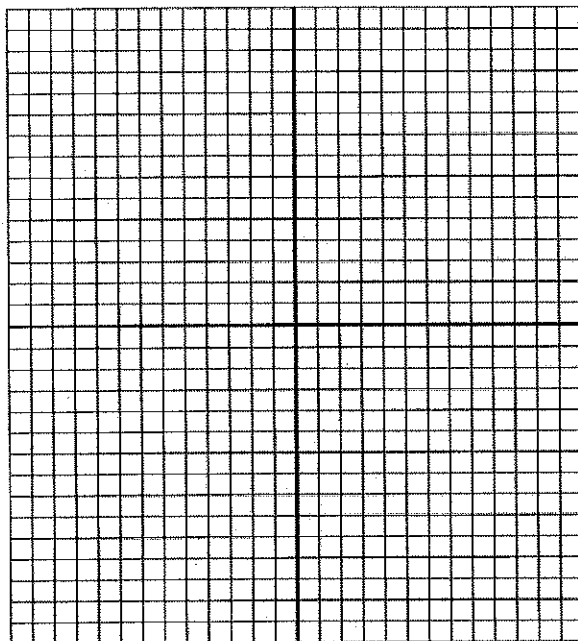
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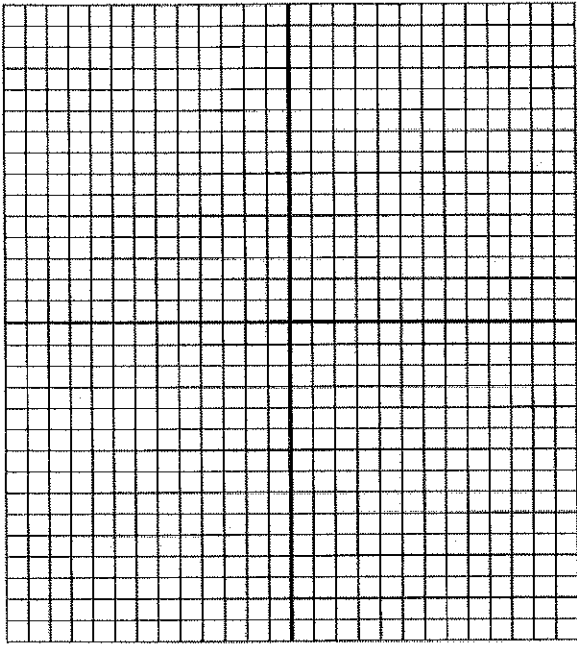
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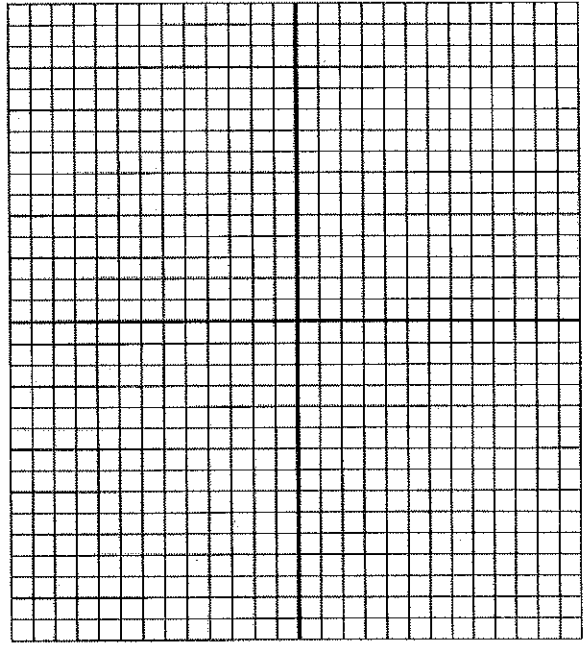
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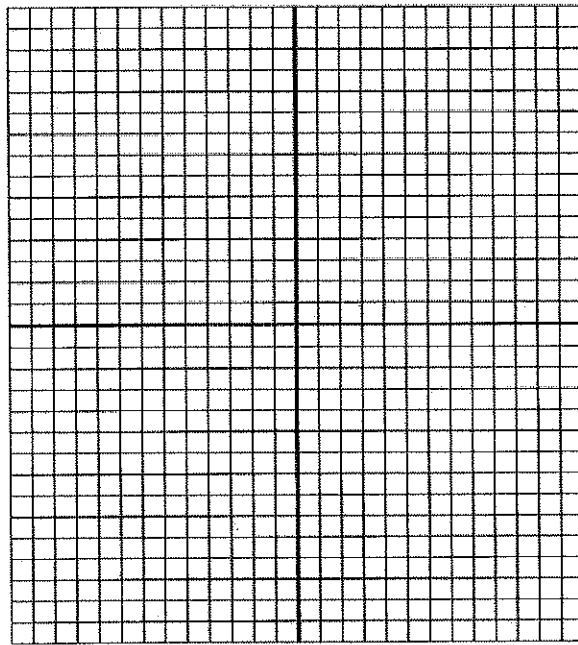
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5.



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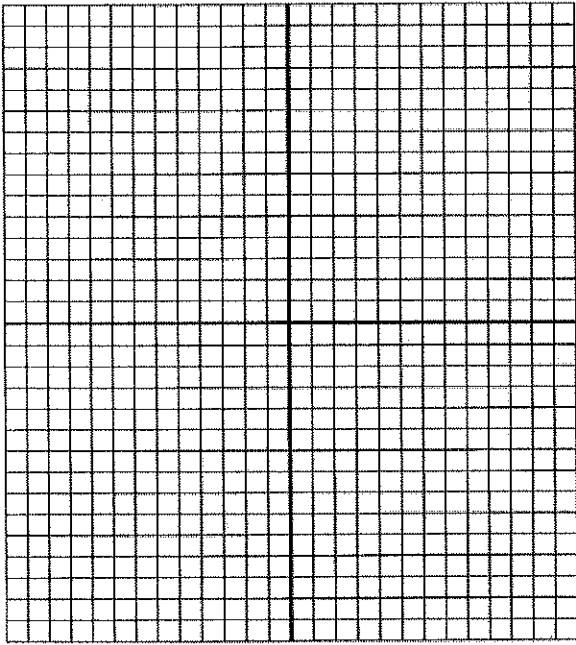
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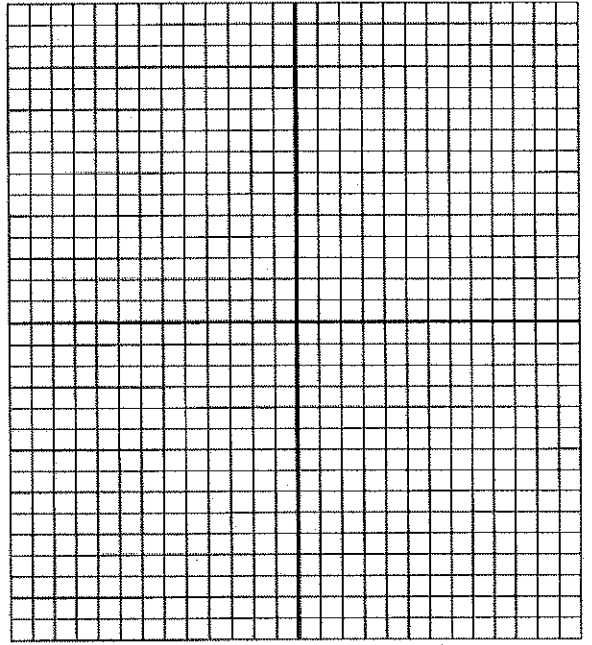
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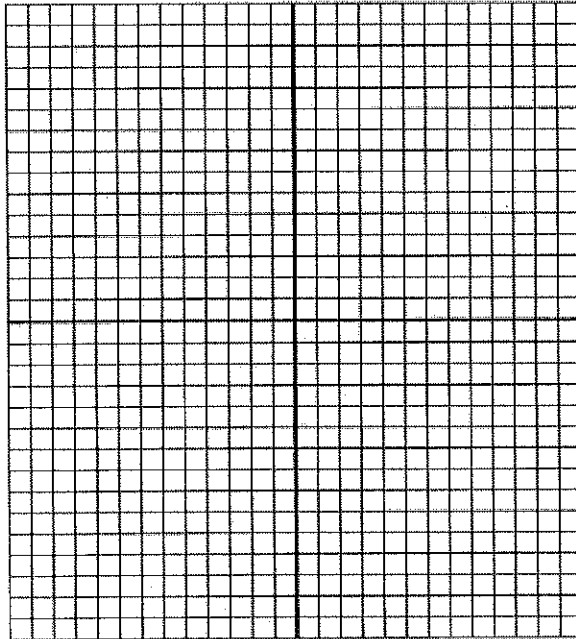
25.



26.



27.



28.

29.

30.

POLYNOMIALS

Find the sum or difference.

- $(a^2 - 4a + 6) + (-3a^2 + 13a + 1)$
- $(5x^2 - 2) + (8x^3 + 2x^2 - x + 9)$
- $(15n^2 + 7n - 1) - (4n^2 - 3n - 8)$
- $(9c^3 - 11c^2 + 2c) - (-6c^2 - 3c + 11)$

Find the product.

- $(2z + 9)(z - 7)$
- $(5m - 8)(5m - 7)$
- $(b + 2)(-b^2 + 4b - 3)$
- $(5 + 7y)(1 - 9y)$
- $(2x^2 - 3x + 5)(x - 4)$
- $(5p - 6)(5p + 6)$
- $(12 - 3g)^2$
- $(2s + 9t)^2$
- $(11a - 4b)(11a + 4b)$

Factor the polynomial.

- $x^2 + 8x + 7$
- $2n^2 - 11n + 15$
- $-12r^2 + 5r + 3$
- $t^2 - 10t + 25$
- $-3n^2 + 75$
- $3x^2 + 29x - 44$
- $x^2 - 49$
- $2a^4 + 21a^3 + 49a^2$
- $y^3 + 2y^2 - 81y - 162$

Solve the equation.

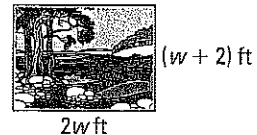
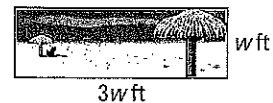
- $25a = 10a^2$
- $21z^2 + 85z - 26 = 0$
- $x^2 - 22x = -121$
- $a^2 - 11a + 24 = 0$
- $t^2 + 7t = 60$
- $4x^2 = 22x + 42$
- $56b^2 + b = 1$
- $n^3 - 121n = 0$
- $a^3 + a^2 = 64a + 64$

32. **VERTICAL MOTION** A cricket jumps off the ground with an initial vertical velocity of 4 feet per second.

- Write an equation that gives the height (in feet) of the cricket as a function of the time (in seconds) since it jumps.
- After how many seconds does the cricket land on the ground?

33. **POSTER AREA** Two posters have the lengths and widths shown. The posters have the same area.

- Write an equation that relates the areas of the two posters.
- Find the length and width of each poster.



34. **CONSTRUCTION** A construction worker is working on the roof of a building. A drop of paint falls from a rafter that is 225 feet above the ground. After how many seconds does the paint hit the ground?

35. **BOX DIMENSIONS** A cardboard box that is a rectangular prism has the dimensions shown.

- Write a polynomial that represents the volume of the box.
- The volume of the box is 60 cubic inches. What are the length, width, and height of the box?



POLYNOMIALS ANSWER SHEET

NAME _____

1.

2.

3.

4.

5.	6.	7.
8.	9.	10.
11.	12.	13.

14.	15.	16.
17.	18.	19.
20.	21.	22.

23.	24.	25.
26.	27.	28.
29.	30.	31.

32. a.

b.

33. a.

b.

34.

35. a.

b.