SUMMER MATH PACKET 1-C

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.

- Problems 1-70 have multiple choice answers. For most of them, work is required. Please print out the answer pages (pages 2-6 of the packet), show your work, and the letter of the correct choice.
- You must show all work, except in cases where there is no work to be shown (such as 1-4).
- Problems 71- 92 (only the odd problems) should be done in the booklet itself.
- No calculator for this problem set!
- Attach your solutions to the multiple choice problems to the pages containing problems 71-87, and give these 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 meeting you.

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

1)	**9)**
3)	**11)**
5)	**13)**
7)	**15)**

17)	**25)**
19)	**27)**
21)	**29)**
23)	**31)**

33)	**41))**
35)	**43)**
37)	**45)**
39)	**47)**

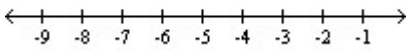
49)	**57)**
51)	**59)**
53)	**61)**
55)	**63)**

65)
67)
69)

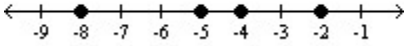
Multiple Choice
Identify the choice that best completes the statement or answers the question.

1) **On the real number line, label the points with the given coordinates.**

-8, -6, -4, -2



a.



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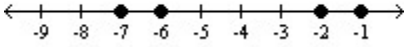

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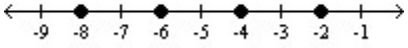

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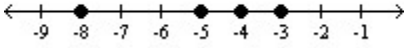
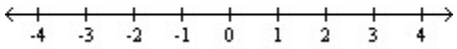
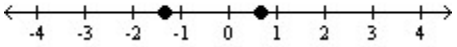


2) **On the real number line, label the points with the given coordinates.**

$\frac{4}{3}, -\frac{4}{3}$



a.



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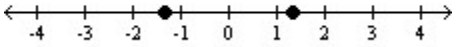

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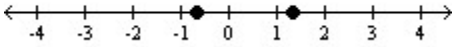
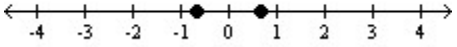


d.



3) **Replace the question mark by <, >, or =, whichever is correct.**

$\frac{1}{8}$? 0.125

a. =
b. >
c. <

4) **Replace the question mark by <, >, or =, whichever is correct.**

2.23 ? $\sqrt{5}$

a. =
b. >
c. <

5) **Evaluate the expression using the given values.**

x + 6y x = -5, y = -2

a. 1
b. -7
c. -32
d. -17

6) **Evaluate the expression using the given values.**

$\frac{3x - 2y}{2}$ x = 7, y = 8

a. 5
b. $\frac{19}{2}$
c. $\frac{37}{2}$
d. $\frac{5}{2}$

7) **Evaluate the expression using the given values.**

$|6x - 7y|$ x = 5, y = 5

a. -65
b. 65
c. 5
d. -5

8) **Use the formula C = $\frac{5}{9}$(F - 32) for converting degrees Fahrenheit into degrees Celsius to find the Celsius measure of the Fahrenheit temperature.**

F = 41°

a. 5° C
b. 15° C
c. 10° C
d. 0° C

9) **Express the statement as an equation involving the indicated variables.**

The area A of a rectangle is the product of its length l and its width w.

a. $A = l + w$
c. $A = 2(l + w)$
b. $A = lw$
d. $A = \frac{l}{w}$

10) **Express the statement as an equation involving the indicated variables.**

The circumference C of a circle is the product of π and its diameter d.

a. $C = \pi + d$
c. $C = \frac{\pi}{d}$
b. $C = 2\pi d$
d. $C = \pi d$

11) **Express the statement as an equation involving the indicated variables.**

The surface area S of a sphere is 4 times π times the square of the radius r.

a. $S = 4\pi r^2$
c. $S = 4\pi \sqrt{r}$
b. $S = 4\pi r$
d. $S = \pi r^2$

12) **Solve the problem.**

The weekly production cost C of manufacturing x calendars is given by $C(x) = 20 + 3x,$ where the variable C is in dollars. What is the cost of producing 231 calendars?

a. $4623.00
c. $713.00
b. $693.00
d. $251.00

13) **Determine which value(s), if any, must be excluded from the domain of the variable in the expression.**

$$\frac{x}{x - 4}$$

a. $x = 4$
c. $x = 0$
b. $x = -4$
d. none

14) **Determine which value(s), if any, must be excluded from the domain of the variable in the expression.**

$$\frac{x - 8}{x - 4}$$

a. $x = 0$
c. none
b. $x = 4$
d. $x = -4$

15) **Simplify the expression.**

-5^3

a. 15
c. 125
b. -125
d. -15

16) **Simplify the expression.**

5^{-4}

a. $\frac{1}{625}$
c. -625
b. 625
d. $\frac{1}{20}$

17) **Simplify the expression.**

$(-5)^{-2}$

a. 25
c. $\frac{1}{25}$
b. $-\frac{1}{25}$
d. -25

18) **Simplify the expression.**

-5^{-3}

a. 125
c. -125
b. $-\frac{1}{125}$
d. $\frac{1}{15}$

19) **Simplify the expression.**

$3^{-7} \cdot 3^6$

a. 1
c. 3
b. $\frac{1}{3}$
d. $\frac{1}{9}$

20) **Simplify the expression. Express the answer so that all exponents are positive. Whenever an exponent is 0 or negative, we assume that the base is not 0.**

$(x^9y^{-1})^3$

a. $\frac{y^3}{x^{27}}$
c. $x^{27}y^3$
b. $\frac{x^{27}}{y^3}$
d. $\frac{1}{x^{27}y^3}$

21) **Simplify the expression. Express the answer so that all exponents are positive. Whenever an exponent is 0 or negative, we assume that the base is not 0.**

$$\frac{x^{-2}y^4}{xy^7}$$

a. $\frac{y^3}{x^3}$

b. $\frac{1}{x^3y^3}$

c. $\frac{x}{y^3}$

d. $\frac{1}{xy^3}$

22) **Simplify the expression. Express the answer so that all exponents are positive. Whenever an exponent is 0 or negative, we assume that the base is not 0.**

$$\left(\frac{7x^{-4}}{3y^{-4}}\right)^{-2}$$

a. $\frac{49x^{42}}{9y^{42}}$

b. $\frac{9x^8}{49y^8}$

c. $\frac{49x^8}{9y^8}$

d. $\frac{9y^8}{49x^8}$

23) **Simplify the expression. Express the answer so that all exponents are positive. Whenever an exponent is 0 or negative, we assume that the base is not 0.**

$$\left(\frac{-4x^4y^{-6}}{3z^7}\right)^{-1}$$

a. $\frac{3y^6}{-4x^4z^7}$

b. $\frac{-4x^4}{3y^6z^7}$

c. $\frac{3y^6z^7}{-4x^4}$

d. $\frac{3z^7}{-4x^4y^6}$

24) **Evaluate the expression using the given value of the variables.**

$-8x^{-1}y^2$ for $x = 2$, $y = -2$

a. -64

b. $-\frac{1}{4}$

c. - 16

d. - 1

25) **Simplify the expression.**

$$\sqrt{(-9)^2}$$

a. $\frac{1}{81}$

b. 6561

c. 9

d. not a real number

26) **Find the value of the expression using the given values.**

$\sqrt{x^2 + y^2}$ for x = 3, y = -2

a. 6
b. $\sqrt{13}$
c. 1
d. 5

27) **The lengths of the sides of a triangle are given. Determine if the triangle is a right triangle. If it is, identify the hypotenuse.**

1, 2, 3

a. right triangle; 3
b. not right triangle
c. right triangle; 1
d. right triangle; 2

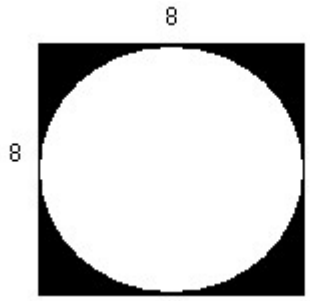
28) **The lengths of the sides of a triangle are given. Determine if the triangle is a right triangle. If it is, identify the hypotenuse.**

15, 20, 25

a. right triangle; 15
b. not a right triangle
c. right triangle; 20
d. right triangle; 25

29) **Solve the problem.**

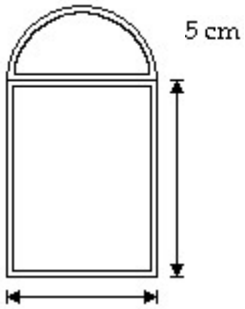
Find the area of the shaded region. Express the answer in teems of π.



a. 256 - 64π square units
b. 16π + 64 square units
c. 64 - 32π square units
d. 64 - 16π square units

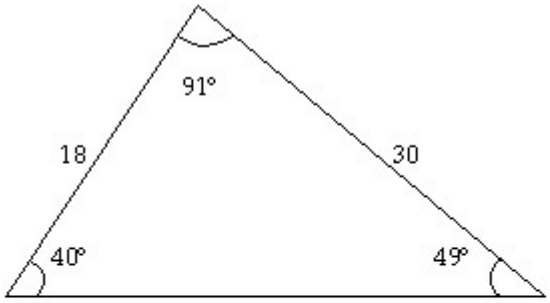
30) **Solve the problem.**

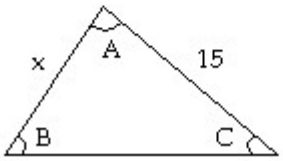
Find the perimeter. Approximate the result to the nearest tenth using 3.14 for π.



a. 17.7 cm
b. 22.4 cm
c. 20.7 cm
d. 25.4 cm

31) **The triangles are similar. Find the missing length x and the missing angles A, B, C.**





a. x = 9 units; A = 91°; B = 40°; C = 49°
b. x = 18 units; A = 40°; B = 91°; C = 49°
c. x = 9 units; A = 49°; B = 40°; C = 91°
d. x = 18 units; A = 91°; B = 40°; C = 49°

32) **Tell whether the expression is a monomial. If it is, name the variable(s) and coefficient, and give the degree of the monomial.**

$16x^9$

a. Monomial; variable x; coefficient 9; degree 0
b. Monomial; variable x; coefficient 9; degree 16
c. Not a monomial
d. Monomial; variable x; coefficient 16; degree 9

33) **Tell whether the expression is a monomial. If it is, name the variable(s) and coefficient, and give the degree of the monomial.**

$\frac{19}{x}$

a. Not a monomial
b. Monomial; variable x; coefficient 19; degree -1
c. Monomial; variable x; coefficient 19; degree 1
d. Monomial; variable x; coefficient 19; degree 0

34) **Tell whether the expression is a polynomial. If it is, give its degree.**

$7x^2 - \frac{4}{x}$

a. Polynomial; degree 1
b. Polynomial; degree -1
c. Not a polynomial
d. Polynomial; degree 2

35) **Add, subtract, or multiply, as indicated. Express your answer as a single polynomial in standard form.**

$(5x^2 + 7x - 8) + (5x^2 + 6x + 6)$

a. $-3x^2 + 11x + 13$
b. $10x^2 + 13x - 2$
c. $10x^2 - 13x - 2$
d. $10x^2 + 13x + 2$

36) **Add, subtract, or multiply, as indicated. Express your answer as a single polynomial in standard form.**

$(-9x^2 + 4) - (-x^3 - 2x^2 + 3)$

a. $-8x^3 - 2x^2 + 1$
b. $-8x^3 + 2x^2 - 3$
c. $x^3 - 7x^2 + 1$
d. $x^3 - 11x^2 + 7$

37) **Add, subtract, or multiply, as indicated. Express your answer as a single polynomial in standard form.**

$8(1 - y^3) + 5(1 + y + y^2 + y^3)$

a. $3y^3 + 5y^2 + 5y + 13$
b. $-3y^3 + 5y^2 + 5y + 13$
c. $-3y^3 - 5y^2 + 5y - 13$
d. $-3y^3 + 5 - ay^2 + 5y + 13$

38) **Add, subtract, or multiply, as indicated. Express your answer as a single polynomial in standard form.**

$(4x - 11)(x - 4)$

a. $4x^2 - 27x + 44$
b. $x^2 - 27x - 28$
c. $4x^2 - 28x + 44$
d. $x^2 + 44x - 27$

39) **Multiply the polynomials using the special product formulas. Express the answer as a single polynomial in standard form.**

$(x + 5)(x - 5)$

a. $x^2 - 10x - 25$
b. $x^2 - 25$
c. $x^2 + 10x - 25$
d. $x^2 - 10$

40) **Multiply the polynomials using the special product formulas. Express the answer as a single polynomial in standard form.**

$(2x - 10)(2x + 10)$

a. $4x^2 + 40x - 100$
b. $4x^2 - 100$
c. $4x^2 - 40x - 100$
d. $2x^2 + 40x - 100$

41) **Multiply the polynomials using the special product formulas. Express the answer as a single polynomial in standard form.**

$(7x + 11)^2$

a. $49x^2 + 121$
b. $7x^2 + 154x + 121$
c. $49x^2 + 154x + 121$
d. $7x^2 + 121$

42) **Find the quotient and the remainder.**

$9x^8 - 15x^4$ divided by $3x$

a. $3x^7 - 5x^3$; remainder 0
b. $3x^9 - 5x^5$; remainder 0
c. $9x^7 - 15x^3$; remainder 0
d. $3x^8 - 5x^4$; remainder 0

43) **Factor completely. If the polynomial cannot be factored, say it is prime.**

$x^2 - 9$

a. $(x + 9)(x - 9)$
b. $(x^2 + 3)(x^2 - 3)$
c. $(x + 3)(x - 3)$
d. $(x - 3)(x - 3)$

44) **Factor completely. If the polynomial cannot be factored, say it is prime.**

$9x^2 - 1$

a. $(3x - 1)^2$
b. $(3x + 1)^2$
c. $(3x - 1)(3x + 1)$
d. prime

45) **Factor completely. If the polynomial cannot be factored, say it is prime.**

$25x^2 - 64$

a. $(25x + 1)(x - 64)$
b. $(5x + 8)^2$
c. $(5x + 8)(5x - 8)$
d. $(5x - 8)^2$

46) **Factor completely. If the polynomial cannot be factored, say it is prime.**

$x^2 + 2x + 1$

a. $(x - 1)^2$
b. $(x + 2)(x - 2)$
c. $(x + 1)^2$
d. $(x + 1)(x - 1)$

47) **Factor completely. If the polynomial cannot be factored, say it is prime.**

$81x^2 - 126x + 49$

a. $(9x + 7)^2$
b. $(9x + 7)(9x - 7)$
c. $(9x - 8)^2$
d. $(9x - 7)^2$

48) **Factor completely. If the polynomial cannot be factored, say it is prime.**

$6x^2 - 13xt + 6t^2$

a. $(3x + 2t)(2x + 3t)$
b. $(3x - 2t)(2x - 3t)$
c. prime
d. $(6x - 2t)(x - 3t)$

49) **Reduce the rational expression to lowest terms.**

$$\frac{x^2 - 25}{x - 5}$$

a. $x - 5$
b. $\frac{1}{x + 5}$
c. $x + 5$
d. $\frac{1}{x - 5}$

50) **Reduce the rational expression to lowest terms.**

$$\frac{x^2 + 14x + 49}{x^2 + 16x + 63}$$

a. $\frac{x + 7}{x + 9}$

b. $\frac{14x + 7}{16x + 9}$

c. $\frac{14x + 49}{16x + 63}$

d. $-\frac{x^2 + 14x + 49}{x^2 + 16x + 63}$

51) **Perform the indicated operations and simplify the result. Leave the answer in factored form.**

$$\frac{5x}{10x + 5} \cdot \frac{4x + 2}{3}$$

a. $\frac{2x}{3}$

b. $\frac{2x}{15}$

c. $\frac{x}{3}$

d. $\frac{2}{3}$

52) **Perform the indicated operations and simplify the result. Leave the answer in factored form.**

$$\frac{3x - 3}{x} \cdot \frac{6x^2}{4x - 4}$$

a. $\frac{2}{9x}$

b. $\frac{9x}{2}$

c. $\frac{18x^3 - 18x^2}{4x^2 - 4x}$

d. $\frac{12x^2 + 24x + 12}{6x^3}$

53) **Perform the indicated operations and simplify the result. Leave the answer in factored form.**

$$\frac{x^2 + 15x + 56}{x^2 + 14x + 48} \cdot \frac{x^2 + 15x + 54}{x^2 + 16x + 63}$$

a. 1

b. $\frac{x + 7}{x + 6}$

c. $\frac{x + 6}{x + 9}$

d. $\frac{1}{x + 9}$

54) **Perform the indicated operations and simplify the result. Leave the answer in factored form.**

$$\frac{\frac{9x-9}{2}}{\frac{3x-3}{22}}$$

a. $\frac{1}{33}$

b. $\frac{27(x-1)^2}{44}$

c. $\frac{11(9x-9)}{3x-3}$

d. 33

55) **Perform the indicated operations and simplify the result. Leave the answer in factored form.**

$$\frac{x}{11} - \frac{9}{5}$$

a. $\frac{x-9}{55}$

b. $\frac{5x-99}{55}$

c. $\frac{5x+99}{99}$

d. $\frac{x-9}{16}$

56) **Perform the indicated operations and simplify the result. Leave the answer in factored form.**

$$\frac{9x+3}{2} - \frac{9x-3}{2}$$

a. 9

b. 3

c. 9x

d. 0

57) **Perform the indicated operations and simplify the result. Leave the answer in factored form.**

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

a. $\frac{6}{7x}$

b. 1

c. $\frac{7}{6x}$

d. $\frac{7}{12x}$

58) **Perform the indicated operations and simplify the result. Leave the answer in factored form.**

$$\frac{2x^2}{x-1} - \frac{2x}{x-1}$$

a. $\frac{2x}{x-1}$

b. $\frac{2x(x+1)}{x-1}$

c. 0

d. 2x

59) **Find the LCM of the given polynomials.**

x, x + 9

a. x + 9

b. x(x + 9)

c. $x^2(x+9)$

d. x

60) **Perform the indicated operations and simplify the result. Leave the answer in factored form.**

$$\frac{x}{x^2-16} - \frac{6}{x^2+5x+4}$$

a. $\frac{x^2-5}{(x-4)(x+4)(x+1)}$

b. $\frac{x^2-5x+24}{(x-4)(x+4)(x+1)}$

c. $\frac{x^2-5x+24}{(x-4)(x+4)}$

d. $\frac{x^2+5x+24}{(x-4)(x+4)(x+1)}$

61) **Perform the indicated operations and simplify the result. Leave the answer in factored form.**

$$\frac{\frac{4}{x}+1}{\frac{4}{x}-1}$$

a. $\frac{4+x}{4-x}$

b. 4

c. $\frac{x^2}{x^2+4}$

d. $x^2 + 4$

62) **Solve the equation.**

$x(5x - 3) = (5x + 1)(x - 4)$

a. $\left\{-\frac{4}{17}\right\}$

b. $\left\{-\frac{1}{4}\right\}$

c. $\langle -2 \rangle$

d. $\langle 4 \rangle$

63) **Solve the equation.**

$$\frac{9}{2x - 2} = \frac{5}{x + 5}$$

a. {-55}

b. {-35}

c. {55}

d. {40}

64) **Solve the equation.**

$$\frac{3}{x + 6} = \frac{7}{x - 6}$$

a. $\langle 15 \rangle$

b. $\langle -15 \rangle$

c. $\langle -3 \rangle$

d. $\left\{\frac{6}{5}\right\}$

65) **Solve the equation by factoring.**

$x^2 + 3x = 0$

a. {0, 3}

b. {3}

c. {- 3}

d. {0, - 3}

66) **Solve the equation by factoring.**

$39x^2 + 27x = 0$

a. $\left\{\frac{9}{13}, -\frac{9}{13}\right\}$

b. $\left\{-\frac{9}{13}, 0\right\}$

c. $\left\{\frac{9}{13}, 0\right\}$

d. {0}

67) **Solve the equation by factoring.**

$x^2 - 5x + 6 = 0$

a. {2, 3}

b. {-2, 3}

c. {-2, -3}

d. {2, -3}

68) **Solve the equation by factoring.**

$x(x - 10) + 24 = 0$

a. {-6, 4}
b. {6, -4}
c. {6, 4}
d. {-6, -4}

69) **Solve the equation by factoring.**

$6x - 17 = \frac{3}{x}$

a. $\left\{\frac{1}{17}, -\frac{1}{6}\right\}$
b. {-6, 3}
c. $\left\{-\frac{1}{6}, 6\right\}$
d. $\left\{-\frac{1}{6}, 3\right\}$

70) **Solve the equation by the Square Root Method.**

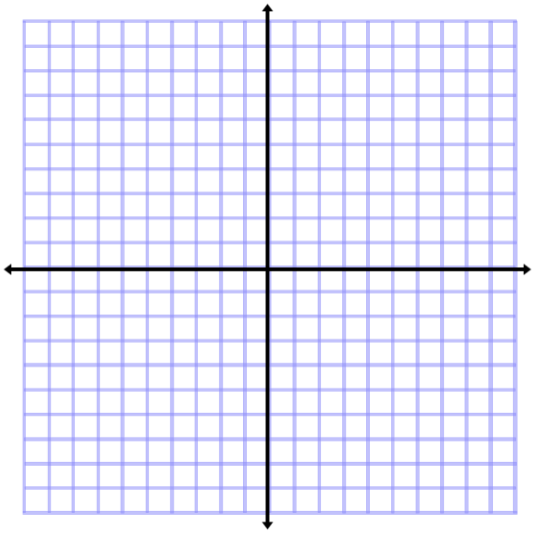
$(x - 5)^2 = 16$

a. {1, -9}
b. {4, -4}
c. {9, 1}
d. {21}

Use the slope and intercept to graph the following lines.

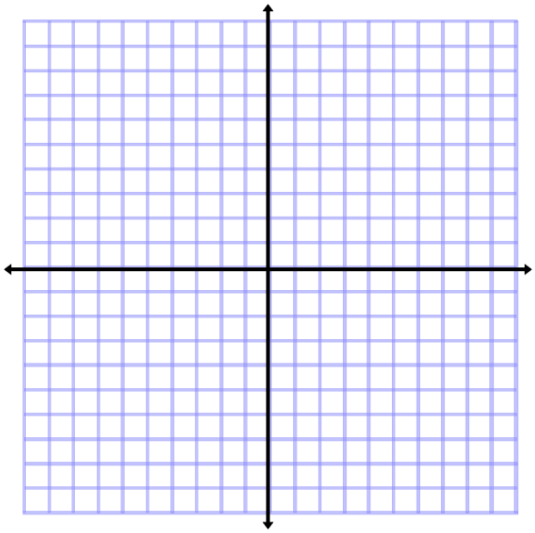
71) $y = 2x + 5$

Slope: _____ Intercept: _____



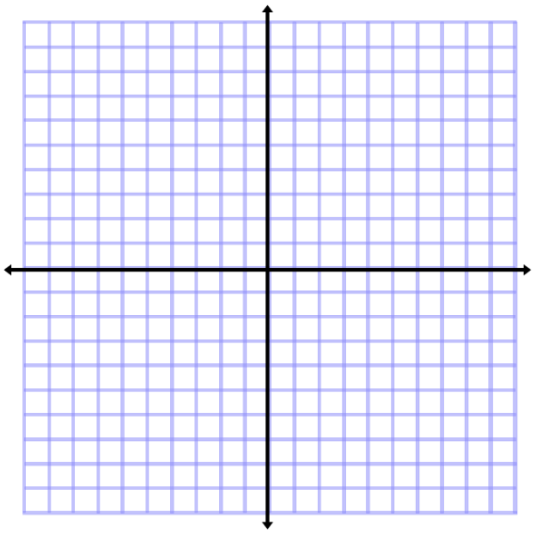
72) $y = -3x$

Slope: _____ Intercept: _____



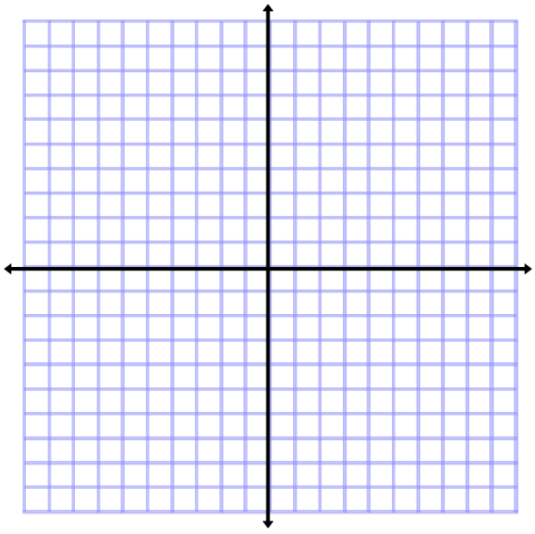
73) $y = -\frac{2}{5}x + 4$

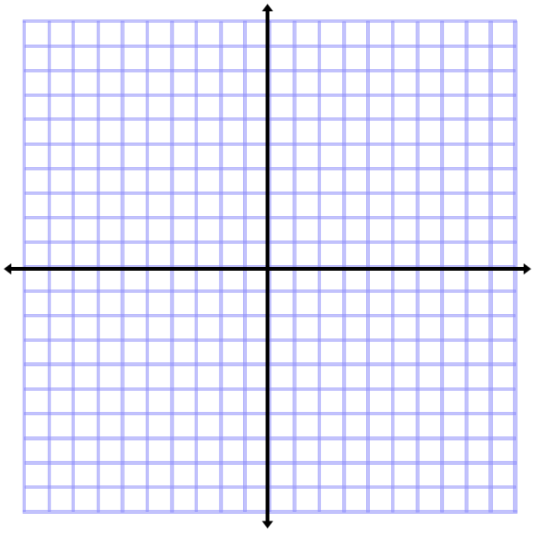
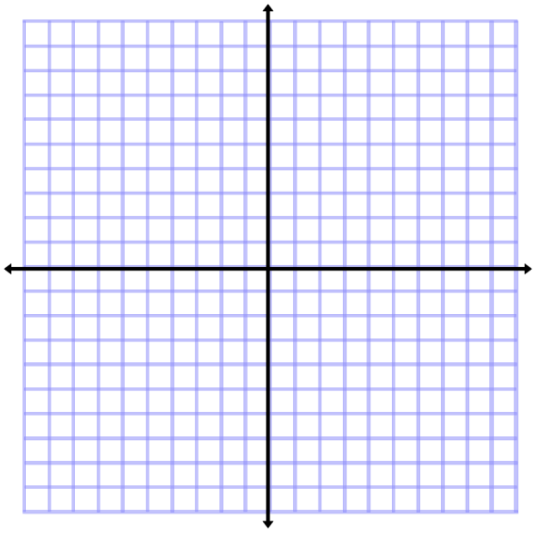
Slope: _____ Intercept: _____



74) $y = \frac{1}{2}x - 3$

Slope: _____ Intercept: _____

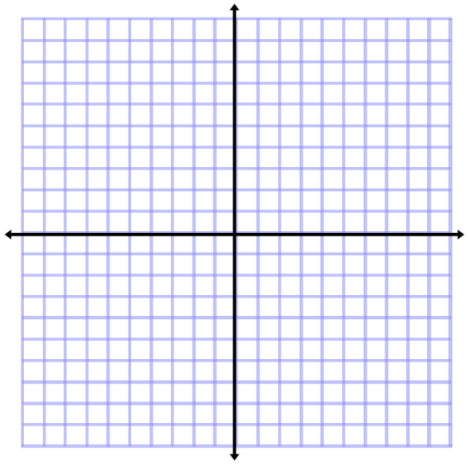


75) $y = -x + 2$ Slope: _____ Intercept: _____ 	76) $y = x$ Slope: _____ Intercept: _____ 

The following equations are in standard form. Rewrite them in slope intercept form, identify the y-intercept and slope, and then graph them.

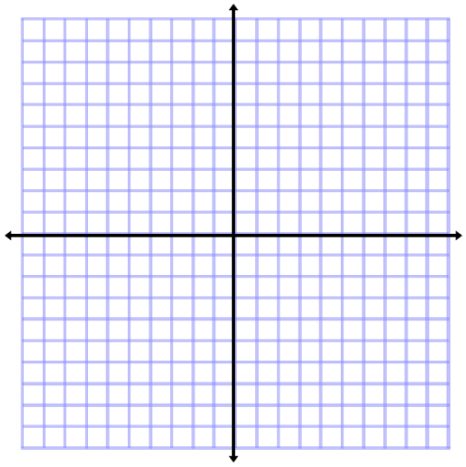
77) $5x + 2y = 10$

Slope: _____ Intercept: _____



78) $4x - 3y = 9$

Slope: _____ Intercept: _____

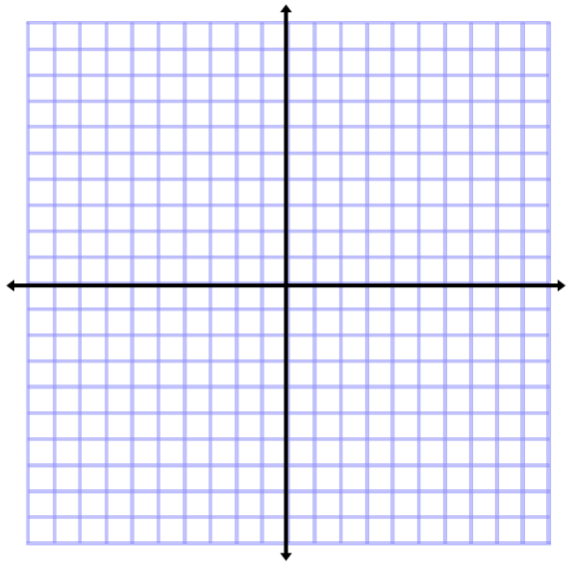


The following equations are in standard form. Solve for the x-intercept and y-intercept. Then graph the lines by plotting these points on the appropriate axes and connecting them.

79) $3x + y = 3$

To find the x-intercept, let $y = 0$ and solve for x.

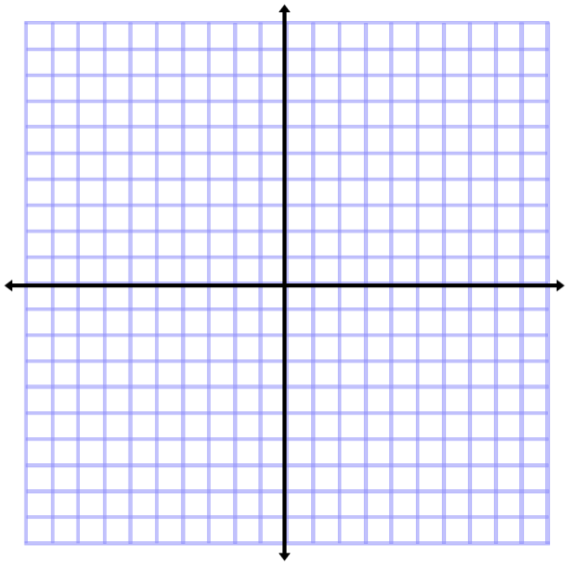
To find the y-intercept, let $x = 0$ and solve for y.



80) $-2x + 6y = 12$

To find the x-intercept, let $y = 0$ and solve for x.

To find the y-intercept, let $x = 0$ and solve for y.



81) Find the x-intercept of the equation $x + 5y = 20$.

82) Find the x- and y-intercepts of $3x - y = 6$.

83) Find the slope of the line that contains the points $(6, 8)$ and $(2, 1)$.

84) Find the slope of the line that contains the points $(4, 5)$ and $(7, 11)$.

85) Find the distance between the points $A(6, 7)$ and $B(2, 4)$.

86) Find the distance between the points $A(5, 6)$ and $B(1, 3)$.

87) Find the coordinates of the midpoint of $\overline{AB}$ with endpoints $A(2,-6)$ and $B(-6,2)$.

88) Write an equation in point-slope form that describes the line with a slope of -3 that contains the point $(1,2)$.

89) Write an equation in slope-intercept form for the line that passes through $(0,-1)$ and is perpendicular to the line described by $=\frac{1}{8}x+4$.

90) Write an equation in slope-intercept form for the line that passes through $(-3,2)$ and is perpendicular to the line described by $y=\frac{3}{2}x+4$

91) Write an equation in slope-intercept form for the line that passes through $(24, 5)$ and is parallel to the line described by $= \frac{1}{8}x + 4$.

92) Write an equation in slope-intercept form for the line that passes through $(-4, -6)$ and is parallel to the line described by $y = \frac{3}{2}x + 4$