

# Methacton High School

## Algebra 2 – Summer Math Packet 2020

### Welcome 2020/21 Algebra 2 Students and Parents!

This packet was designed for you to practice the mathematical skills that all Algebra 2 students are expected to have upon entering the course. Take the time to complete all the problems in this packet. Make sure you understand how to do the problems. These prerequisite skills will make your time in Algebra 2 much easier and will greatly increase the likelihood of a successful school year. **If you are unsure of how to complete some of the problems, please click on the links provided below to access online videos for extra help. You may also search the topics listed below at [www.Khanacademy.org](http://www.Khanacademy.org) for additional resources.**

The Algebra 2 Summer Packet will be due the first week of school. This packet will not be graded. However, you will have a test on the material from the packet during the beginning weeks of school.

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**Section 1: Simplifying Algebraic Expressions****Simplify the expression.**

1)  $5a + 6b + 7a$

2)  $(4p - 7q) - (5q - 8p)$

3)  $5x^2 + 3x - 2 - 4x^2 + 5x - 4$

4)  $4(2x^2 + y) + 5(x^2 - 3y)$

**Section 2: Evaluating Algebraic Expressions****Evaluate the expression for the given value of the variable.**

5)  $x + 2x - x - 1; x = 2$

6)  $5c^3 - 6c^2; c = -5$

7)  $4a + 7b - 3 + 6b; a = 2, b = 5$

8)  $\frac{3k+2(k-4)}{k+8}; k = -3$

**Section 3: Solving Linear Equations****Solve the equation. Check your solution.**

9)  $5c - 9 = 8 - 2c$

10)  $5(2 - a) = 0$

11)  $6(n - 4) = 3n$

12)  $4x - 8 = 2(x - 5)$

13)  $\frac{3}{4}x - 1 = 5$

14)  $\frac{x}{6} = \frac{9}{2}$

15)  $-3(a + 4) - 4a = -5$

16)  $3(n - 6) = -18 - 4n$

#### Section 4: Writing and Graphing Linear Equations

Slope Formula:  $m = \frac{y_2 - y_1}{x_2 - x_1}$

Slope-Intercept Form of Line:  $y = mx + b$

Point-Slope Form of a Line:  $y - y_1 = m(x - x_1)$

Write the slope-intercept form of the equation of each line given the slope and y-intercept.

17) Slope = 2, y-intercept = -2

18) Slope =  $-\frac{3}{5}$ , y-intercept = 2

Write the slope-intercept form of the equation of the line that passes through the given point with the given slope.

19) Through:  $(-3, 5)$ , slope = -1

20) Through:  $(5, 0)$ , slope =  $-\frac{3}{5}$

Write the slope-intercept form of the equation of the line that passes through the given points.

21) Through:  $(-4, -2)$  and  $(3, -1)$

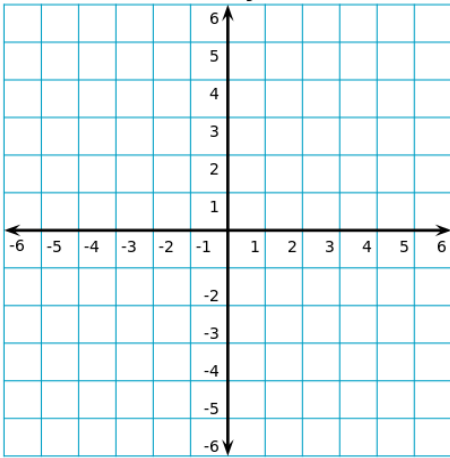
22) Through:  $(0, -2)$  and  $(4, 4)$

23) Write the equation of the line parallel to  $y = 3x + 2$  that passes through  $(-1, -2)$ .

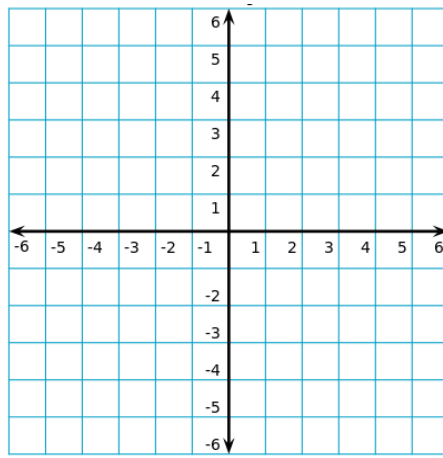
24) Write the equation of a line perpendicular to  $y = \frac{1}{4}x - 5$  that passes through  $(1, 1)$ .

Graph the equation.

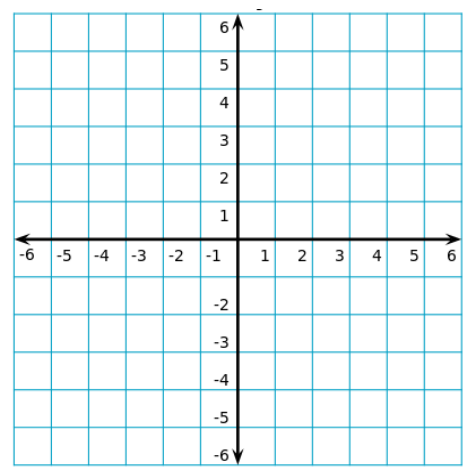
25)  $y = \frac{5}{4}x + 4$



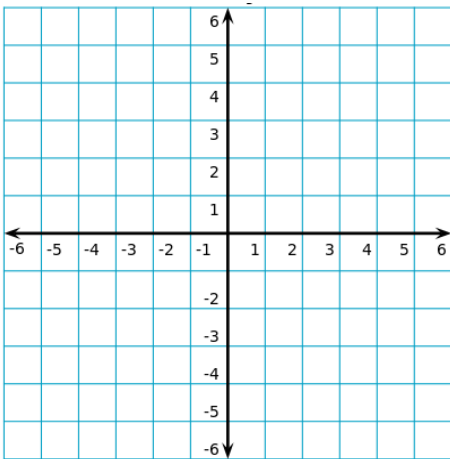
26)  $y = -\frac{2}{3}x + 2$



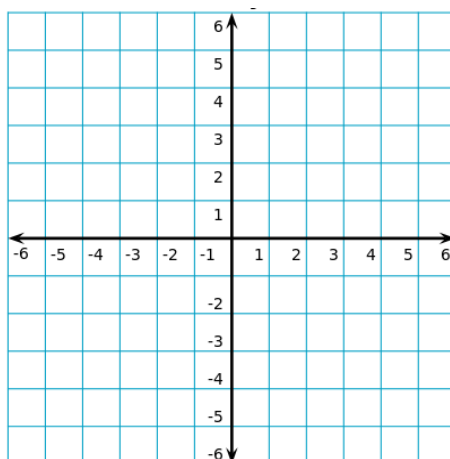
27)  $y = -4$



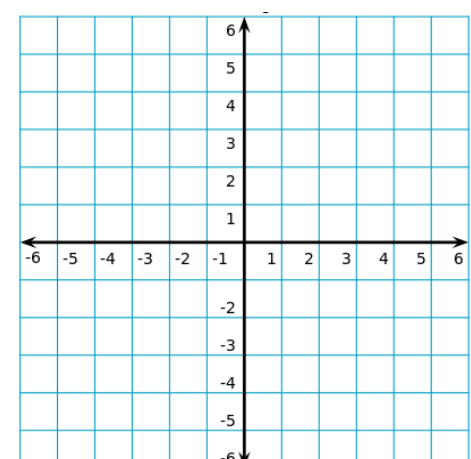
28)  $x = 3$



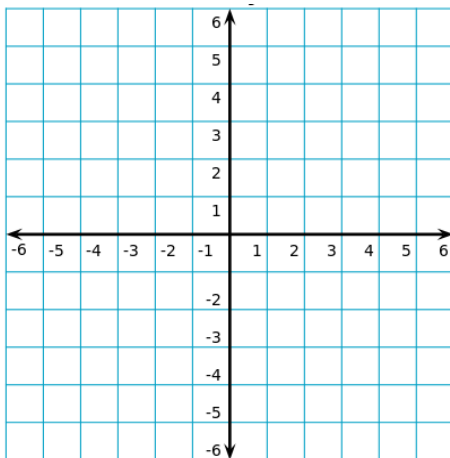
29)  $5x - y = 5$



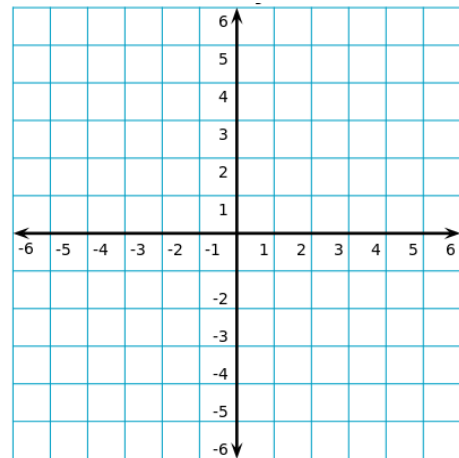
30)  $12 - 3y = -4x$



31.)  $y = 3x - 1$   
 $x + y = 4$



32.)  $y = \frac{3}{2}x$   
 $3x - 2y = 6$



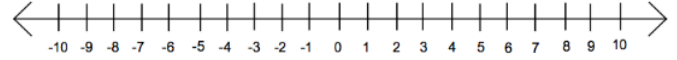
## Section 5: Solving and Graphing Inequalities

Solve each inequality and graph its solution.

33)  $a + 8 < 5$



34)  $20v \leq 110$



35)  $-11 > n - 8$



36)  $-8(r + 3) < -88$



37)  $x - 20 \geq -11$



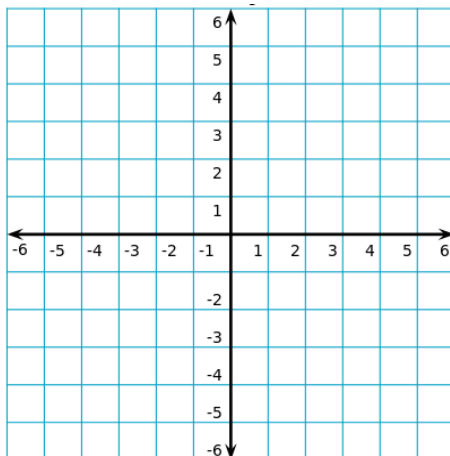
38)  $-13m < 39$



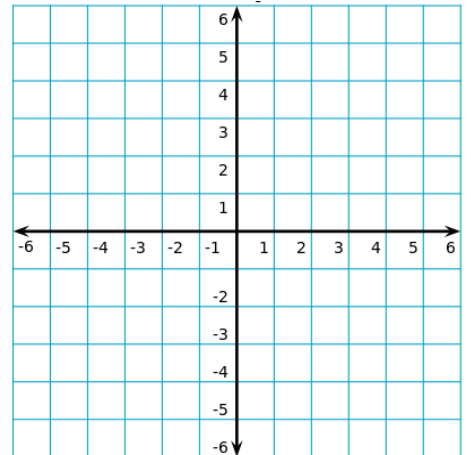
## Section 6: Graphing Linear Inequalities

Graph each linear inequality.

39)  $y \geq -x - 2$



40)  $y < \frac{2}{3}x + 1$



### Section 7: Solving Linear Systems

Solve the following systems of equations by substitution.

$$41) \begin{aligned} x + y &= 7 \\ x &= y + 9 \end{aligned}$$

$$42) \begin{aligned} y &= 2x + 32 \\ 2x + y &= 60 \end{aligned}$$

Solve the following systems of equations by elimination.

$$43) \begin{aligned} x + 2y &= 3 \\ 8x - 2y &= 8 \end{aligned}$$

$$44) \begin{aligned} -3x + 2y &= 14 \\ 2x - 2y &= -6 \end{aligned}$$

### Section 8: Multiplying Polynomial Expressions

Use the FOIL method to multiply the following binomials.

$$45) (2x + 3)(x + 1)$$

$$46) (3x - 2)^2$$

$$47) (x - 4)(x + 3)$$

### Section 9: Factoring Polynomial Expressions

Factor out the Greatest Common Factor.

$$48) 10x^2y^2 + 15xy^3 - 5xy^2$$

$$49) -6rs - 12r^2s + 9rt$$

**Factor by Difference of Squares. If the expression is not factorable, write "N.F."**

50)  $x^2 - 81$

51)  $4t^2 - 25$

52)  $z^2 + 36$

53)  $x^2 - 49$

**Factor each trinomial into two binomials. (Remember to check for GCF.)**

54)  $x^2 - 12x + 32$

55)  $x^2 + 19x + 90$

56)  $x^2 - 4x + 4$

57)  $x^2 + x - 12$

58)  $2x^2 - 9x - 18$

59)  $2x^2 - 6x - 8$

60.)  $3x^2 - 11x - 4$

61.)  $xy - 3y + 4x - 12$

62.)  $x^2 - 2xy + xy - 2y^2$

**Section 10: Simplifying Radical Expressions**

**Simplify the radicals.**

63)  $\sqrt{25}$

64)  $\sqrt{200}$

65)  $\sqrt{96}$

66)  $-5\sqrt{32}$

67)  $\sqrt{80x^2}$

68)  $\sqrt{125x^3}$

**Simplify the radical expressions.**

69)  $2\sqrt{3} + 5\sqrt{3}$

70)  $6\sqrt{12} - 4\sqrt{3}$

71)  $3\sqrt{3} \cdot 4\sqrt{5}$