

Name _____

Summer Mathematics Assignment
Algebra 2 Students

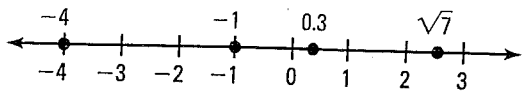
1. This is your summer assignment if you are taking Algebra 2 during the 2010-2011 school year.
2. A. Do all of your work in the space provided. If you need additional space to complete a solution you may use an additional sheet. Be sure to write the **number** of the problem on that paper.

B. Hand in this packet and any additional sheets to your teacher at our first class session.
3. This assignment will count as a 30 point quiz. For each day late, you will lose 2 points from the quiz grade.
4. For 11th graders going to MUSS: hand in your work to Mrs. Gefer in the math office BEFORE you leave for Israel.

If you have any questions, please contact Mrs. Shrager at jshrager@jbha.org

REAL NUMBERS AND NUMBER OPERATIONS

EXAMPLE You can use a number line to graph and order real numbers.



Increasing order (left to right):
 $-4, -1, 0.3, \sqrt{7}$

Properties of real numbers include the closure, commutative, associative, identity, inverse, and distributive properties.

Graph the numbers on a number line. Then write the numbers in increasing order.

1. $-2, 0.2, -\pi, -\sqrt{6}, \frac{6}{5}$

2. $\frac{3}{4}, \sqrt{3}, -1.75, -3, -\frac{4}{3}$

ALGEBRAIC EXPRESSIONS AND MODELS

EXAMPLES You can use order of operations to evaluate expressions.

Numerical expression: $8(3 + 4^2) - 12 \div 2 = 8(3 + 16) - 6 = 8(19) - 6 = 152 - 6 = 146$

Algebraic expression: $3x^2 - 1$ when $x = -5$

$$3(-5)^2 - 1 = 3(25) - 1 = 75 - 1 = 74$$

Sometimes you can use the distributive property to simplify an expression.

Combine like terms: $2x^2 - 4x + 10x - 1 = 2x^2 + (-4 + 10)x - 1 = 2x^2 + 6x - 1$

Evaluate the expression.

3) $-3 - 6 \div 2 - 12$

4) $-5 \div 1 + 2(7 - 10)^2$

5) $7x - 3x - 8x^3$ when $x = -1$

6) $3ab^2 + 5a^2b - 1$ when $a = 2$ and $b = -2$

Simplify the expression.

$$7) 7y - 2x + 5x - 3y + 2x$$

$$8) 4(3 - x) + 5(x - 6)$$

$$9) 6x^2 - 3x + 5x^2 + 2x$$

$$10) 2(x^2 + x) - 3(x^2 - 4x)$$

SOLVING LINEAR EQUATIONS

EXAMPLE You can use properties of real numbers and transformations that produce equivalent equations to solve linear equations.

Solve: $-2(x - 4) = 12$

$$-2x + 8 = 12$$

$$-2x = 4$$

$$x = -2$$

Then check: $-2(-2 - 4) \stackrel{?}{=} 12$

$$-2(-6) \stackrel{?}{=} 12$$

$$12 = 12 \checkmark$$

Solve the equation. Check your solution.

$$11) -5x + 3 = 18$$

$$12) \frac{2}{3}n - 5 = 1$$

$$13) \frac{1}{2}y = -\frac{3}{4}y - 40$$

$$14) 2 - 3a = 4 + a$$

$$15) 8(z - 6) = -16$$

$$16) -4x - 4 = 3(2 - x)$$

REWRITING EQUATIONS AND FORMULAS

EXAMPLES You can solve an equation that has more than one variable, such as a formula, for one of its variables.

Solve the equation for y .

$$2x - 3y = 6$$

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

$$y = \frac{2}{3}x - 2$$

Solve the formula for the area of a trapezoid for h .

$$A = \frac{1}{2}(b_1 + b_2)h$$

$$2A = (b_1 + b_2)h$$

$$\frac{2A}{b_1 + b_2} = h$$

Solve the equation for y .

$$17) 5x - y = 10$$

$$18) x + 4y = -8$$

$$19) 0.1x + 0.5y = 3.5$$

$$20) 2x = 3y + 9$$

$$21) 5x - 6y + 12 = 0$$

$$22) x - 2xy = 1$$

Solve the formula for the indicated variable.

23) Perimeter of a Rectangle

$$\text{Solve for } l: P = 2l + 2w$$

24) Celsius to Fahrenheit

$$\text{Solve for } C: F = \frac{9}{5}C + 32$$

PROBLEM SOLVING USING ALGEBRAIC MODELS

EXAMPLE You can use a problem solving plan in which you write a verbal model, assign labels, write and solve an algebraic model, and then answer the question.

How far can you drive at 55 miles per hour for 4 hours?

VERBAL
MODEL

$$\text{Distance} = \boxed{\text{Rate}} \cdot \boxed{\text{Time}}$$

LABELS

$$\text{Distance} = d \text{ (miles), Rate} = 55 \text{ (miles per hour), Time} = 4 \text{ (hours)}$$

ALGEBRAIC
MODEL

$$d = 55 \cdot 4 = 220$$

► You can drive 220 miles.

25) How long will it take to drive 325 miles at 55 miles per hour?

26) While on vacation, you take a taxi from the airport to your hotel for \$21.85. The taxi costs \$2.95 plus \$1.35 per mile. How far is it from the airport to the hotel?

SOLVING LINEAR INEQUALITIES

EXAMPLES You can use transformations to solve inequalities. Reverse the inequality when you multiply or divide both sides by a negative number.

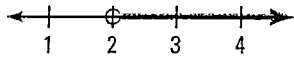
$$4x + 1 < 7x - 5$$

$$0 \leq 6 - 2n \leq 10$$

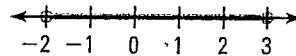
$$-3x < -6$$

$$-6 \leq -2n \leq 4$$

$$x > 2$$



$$3 \geq n \geq -2$$



Solve the inequality. Then graph your solution.

27) $2x - 10 > 6$

28) $12 - 5x \geq -13$

29) $-3x + 4 \geq 2x + 19$

32) $0 < x - 7 \leq 5$

31) $-3 \leq 2y + 1 \leq 5$

32) $3a + 1 < -2$ or $3a + 1 > 7$