

## Algebra I Summer Packet

Algebra I is a rigorous course designed for mathematically talented students who have the conceptual and computational background and maturity to pursue an honors-paced subject. Topics are covered in depth and at an accelerated pace. The curriculum covers algebraic skills and concepts necessary for an understanding of all future mathematics to be studied. Abstract and numerical reasoning are emphasized. Topics include: the Real Number System, absolute value, linear, quadratic, polynomial, radical, rational and exponential equations, functions, systems of equations and inequalities. Graphing calculators are employed to extend concepts. Students learn a variety of problem solving techniques and will apply arithmetic principles to specific algebraic topics. Standardized test preparation is integrated throughout the course. **The completion of a summer assignment is required.**

To be successful in Algebra 1, you will need:

- A lot of pencils
- Graph paper
- A binder with loose-leaf paper
- A TI-83 or 84 graphing calculator

Over the summer, it is your responsibility to review and master the concepts in this packet.

- You will be required to hand in the answers on **THE SECOND DAY OF SCHOOL (September 4th)**. No exceptions.
- This assignment is worth **7 points homework grade**.
- You will have a **quiz** on these topics, on or about **September 10th**.
- This packet should be done **WITHOUT** a calculator.

<u>Topic</u>	<u>Suggested Date of Completion</u>
Fractions (Add/Subtract)	7/20/2019
Comparing Numbers	7/31/2019
Evaluating Expressions	8/5/2019
Distributive Property and Combining Like Terms	8/10/2019
Solving Equations	8/14/2019
Identifying Slope and Y-Intercept from Linear Equation	8/20/2019
Graphing Equations in Slope-Intercept Form	8/25/2019
Percent Problems	8/28/2019
Application	9/02/2019

## Fractions

Find the reciprocal for each number.

1. 7

2.  $\frac{1}{14}$

3.  $\frac{7}{12}$

4.  $\frac{5}{8}$

Add or subtract without using a calculator. Write your answer as a fraction in simplest form.

5.  $\frac{1}{6} + \frac{4}{6}$

6.  $\frac{5}{8} - \frac{3}{8}$

7.  $\frac{4}{9} - \frac{1}{9}$

8.  $\frac{5}{12} + \frac{3}{12}$

9.  $\frac{1}{2} + \frac{1}{8}$

10.  $\frac{3}{5} - \frac{1}{10}$

11.  $\frac{7}{10} + \frac{1}{3}$

12.  $\frac{15}{24} - \frac{7}{12}$

13.  $5\frac{1}{8} - 2\frac{3}{4}$

14.  $4\frac{3}{8} - 2\frac{5}{6}$

15.  $7\frac{1}{2} + \frac{7}{10}$

16.  $4\frac{5}{8} - 1\frac{3}{16}$

17.  $1\frac{3}{7} + \frac{1}{2}$

18.  $\frac{3}{7} + \frac{3}{4}$

19.  $5\frac{5}{9} - 2\frac{1}{3}$

20.  $9\frac{2}{5} + 3\frac{1}{3}$

Multiply or divide without using a calculator. Write your answer as a fraction in simplest form.

21.  $\frac{1}{2} \times \frac{1}{2}$

22.  $\frac{3}{7} \times \frac{3}{9}$

23.  $\frac{4}{5} \div \frac{2}{3}$

24.  $2\frac{1}{4} \div 1\frac{1}{3}$

25.  $\frac{2}{3} \times \frac{4}{5}$

26.  $\frac{7}{8} \div \frac{3}{4}$

27.  $\frac{11}{16} \div 1\frac{1}{2}$

28.  $\frac{3}{4} \times \frac{8}{9}$

29.  $\frac{5}{8} \times \frac{4}{15}$

30.  $\frac{5}{12} \div \frac{1}{2}$

31.  $4\frac{1}{2} \div \frac{3}{4}$

32.  $1\frac{2}{3} \times \frac{3}{5}$

## Comparing and Ordering Numbers

Compare the two numbers. Write the answer using  $<$ ,  $>$ , or  $=$ .

1.  $-16.82$  and  $-14.09$

2.  $0.40506$  and  $0.00456$

3.  $\frac{7}{13}$  and  $\frac{3}{13}$

4.  $\frac{7}{10}$  and  $\frac{3}{4}$

5.  $17\frac{1}{4}$  and  $17\frac{2}{8}$

6.  $-\frac{5}{9}$  and  $-\frac{15}{27}$

Write the numbers in order from least to greatest.

7.  $-45,617$ ;  $-45,242$ ;  $-40,099$ ;  $-40,071$

8.  $23.12$ ,  $-23.5$ ,  $-24$ ,  $-23.08$ ,  $-24.01$

9.  $\frac{3}{5}$ ,  $\frac{3}{2}$ ,  $\frac{3}{4}$ ,  $\frac{3}{10}$ ,  $\frac{3}{7}$

10.  $\frac{1}{3}$ ,  $\frac{5}{6}$ ,  $\frac{3}{8}$ ,  $\frac{5}{4}$

11.  $-14\frac{7}{9}$ ,  $-15\frac{1}{3}$ ,  $-14\frac{5}{6}$ ,  $-15\frac{1}{4}$

12.  $-\frac{7}{8}$ ,  $-\frac{5}{4}$ ,  $-1\frac{1}{3}$ ,  $-\frac{5}{12}$

13. You need a piece of trim that is  $6\frac{5}{8}$  yards long for a craft project. You have a piece of trim that is  $6\frac{3}{4}$  yards long. Is the trim you have long enough?

### Evaluating Expressions

Evaluate the expression without using a calculator.

1.  $180 - (30 + 45)$

2.  $8^2 + (-6)^2$

3.  $\frac{1}{2}(100-74)$

4.  $(8-2) \cdot 180$

5.  $-7 + 2^3 - 9$

6.  $\frac{5+7 \cdot 3}{6+7}$

7.  $16 + 4 \cdot 2 - 3$

8.  $9(7-2)^2$

9.  $\frac{3}{4} \cdot 24 + 4^2 - 1$

Evaluate the expression when  $x = 3$  without using a calculator.

10.  $-3x^2$

11.  $\frac{x+2}{x-2}$

12.  $x^2 + 25$

13.  $(-3x)^2$

14.  $x^2 - 7x + 6$

15.  $-2x - 18$

16.  $x(x - 7)$

17.  $\frac{(x-2) \cdot 180}{x}$

18.  $(x + 2)(x - 2)$

### Distributive Property and Combining Like Terms

Use the distributive property to write the expression without parentheses.

1.  $2(a + 4)$

2.  $-(-3x + 2)$

3.  $y(y - 9)$

4.  $4b(b + 3)$

5.  $(2k + 1)7$

6.  $(7 - 2z)z$

7.  $(j - 1)(-3)$

8.  $-2(n - 6)$

Simplify each expression

9.  $-m + 4 + 7m$

10.  $a^2 + 3a + 3a + 9$

11.  $6h - 3h(h + 1)$

12.  $6x - 9x + x$

13.  $3 - (2x - 7)$

14.  $2(x + 4x) - 7$

15.  $x^2 - 2x + 7x - 14$

16.  $8 + 3(y - 4)$

17.  $y(2y - 6) + y^2$

### Solving Multi-Step Equations

*Solve each equation*

1.  $2x + 3 = 11$

2.  $4x - 2 = 10$

3.  $\frac{7}{6} = \frac{4}{n+5}$

4.  $3y - 4 = 20$

5.  $\frac{x}{7} + 2 = 1$

6.  $10 - x = -16$

7.  $6 - \frac{3a}{2} = -6$

8.  $\frac{3}{8}x - 6 = 18$

9.  $3 = 5 + \frac{1}{4}x$

10.  $5 = 2 - (6 - x)$

11.  $44 = -3g + 5g - 8 - g$

12.  $4(t - 7) + 6 = 30$

13.  $85 = \frac{1}{2}(226 - x)$

14.  $-5x + 3x + 9 = -2$

15.  $14 = 7n + 28$

16.  $22(g - 1) - 2g = 8$

17.  $-d + 12 - 3d - 5d = -6$

18.  $5x + 6 = 11$

19.  $4(m - 2) - 2(3m + 3) = 0$

20.  $22 - 5(6c - 1) = -63$

21.  $5a - 2(4a + 5) = 7a$

22.  $-2(5 + 6m) + 16 = -90$

23.  $2(6k - 1) = -38$

24.  $85 = 9x - 4$

**Identify the Slope and Y-Intercept**

*Identify the slope and y-intercept from the linear equations below.*

1.  $y = -2x + 1$

2.  $y = -x - 8$

3.  $y = 15$

4.  $y = \frac{1}{2}x - 8$

5.  $3 + 4x = y$

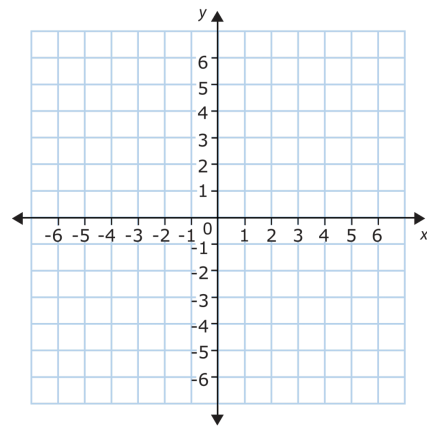
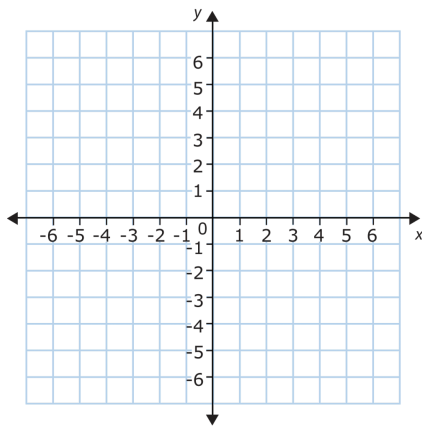
6.  $y = 4 - x$

### Graphing Lines in Slope-Intercept Form

Graph each line, then identify the slope and y-intercept.

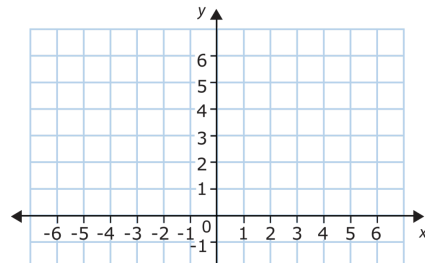
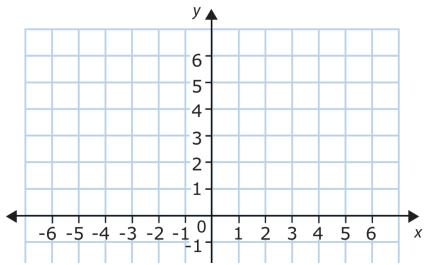
1.  $y = 3x + 5$

2.  $y = -4x - 2$

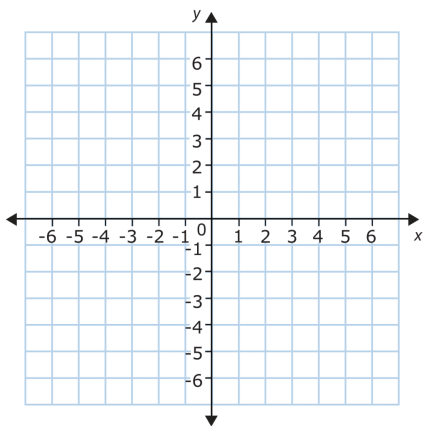


3.  $y = -\frac{1}{2}x + 2$

4.  $y = \frac{3}{2}x$



5.  $y = 2$



**Using the Proportion Method to Solve Percent Problems**

1. What is 25% of 80?
2. 9 is what percent of 200?
3. What is 55% of 600?
4. 5.4 is what percent of 9?
5. 90 is what percent of 40?
6. 120% of what is 60?

**Application**

*Translate the following into an algebraic expression*

1. 14 less than the quotient of 63 and a number "n"
2. The difference of q and 8
3. 9 more than the product of 51 and a number "t"

*Show all work for each application problem.*

4. You work for 4 hours on Saturday and 8 hours on Sunday. You also receive a \$50 bonus. You earn \$164. How much did you earn per hour?

5. Online concert tickets cost \$37 each, plus a service charge of \$8.50 per ticket. The website also charges a transaction fee of \$14.99 for the purchase. You paid \$242.49. How many tickets did you buy?

6. An airplane has a wingspan of 25 feet and a length of 20 ft. You are designing a model of the airplane with a wingspan of 15 inches. What will the length of your model be?

7. A drama club wants to raise at least \$500 in ticket sales for its annual show. The members of the club sold 50 tickets at a special \$5.00 rate. The usual ticket price the day of the show is \$7.50. At least how many tickets do they have to sell the day of the show to meet their goal?

8. In a bird sanctuary, 30% of the birds are hummingbirds. If there are about 350 birds in the sanctuary at any given time, how many are hummingbirds?