

## ADVANCED ALGEBRA II SUMMER WORK

Name: \_\_\_\_\_

These worksheets contain Algebra I practice problems that will help you review and get ready for Advanced Algebra II in the fall.

- Solve all problems, showing work to justify your answers. You may need to attach extra paper.
- Bring the completed packet to the first day of class next year.
- If you don't remember how to do a particular type of problem, you can find help online at sites such as Khan Academy (<http://www.khanacademy.org/>), Hippocampus (<http://www.hippocampus.org/Algebra>) and WebMath (<http://www.webmath.com/>).



**SKILLS PRACTICE 21**  
Chapter 2 Review  
Operations with Negative Numbers

NAME \_\_\_\_\_

DATE \_\_\_\_\_

Evaluate.

1.  $-3(5 - 8)$  \_\_\_\_\_

2.  $6 - (-8)$  \_\_\_\_\_

3.  $6(-8)$  \_\_\_\_\_

4.  $(-2)^2 + 15 - 18$  \_\_\_\_\_

5.  $\frac{-24 + 28}{8 - 6}$  \_\_\_\_\_

6.  $(-3 - 5)(-5 + 8)$  \_\_\_\_\_

7.  $-12 \cdot 3 + 8(-6) - 9$  \_\_\_\_\_

8.  $-3^2 - 24 - 6(-5)$  \_\_\_\_\_

9.  $7 - (8 - 14)$  \_\_\_\_\_

10.  $\frac{36 - 48}{-9} + 4$  \_\_\_\_\_

11.  $|15 - 7|$  \_\_\_\_\_

12.  $|7 - 15|$  \_\_\_\_\_

13.  $(-2)^4 - 2^4$  \_\_\_\_\_

14.  $3(-4) - (-6)$  \_\_\_\_\_

15. Evaluate  $3x^2 - 5x + 4$  if  $x$  is a. 1 \_\_\_\_\_ b. -1 \_\_\_\_\_

16. Evaluate  $\frac{3x - 6}{x + 2}$  if  $x$  is a. -2 \_\_\_\_\_ b. 2 \_\_\_\_\_

Simplify by commuting and associating.

17.  $3 + x - 8$  \_\_\_\_\_

18.  $-6 - x + 19$  \_\_\_\_\_

19.  $15x \cdot 3$  \_\_\_\_\_

20.  $-18x \div (-3)$  \_\_\_\_\_

Solve. Show all transformation steps.

21.  $2x - 4 = -8$  \_\_\_\_\_

22.  $9 - x = 15$  \_\_\_\_\_

23.  $7x + 5 = -9$  \_\_\_\_\_

24.  $6 - 3x = -9$  \_\_\_\_\_

25. Joan can ride her bike at an average of 4 minutes per mile. It takes her about 6 minutes to get her bicycle out, get ready to ride, and put her bike up after the ride.

Let  $m$  be the number of miles she rides.

a. i. Write the definition of  $m$ . \_\_\_\_\_

ii. Write an expression for how many minutes it takes her to pedal  $m$  miles. \_\_\_\_\_

iii. If you add 6 minutes to the answer in part ii, the resulting expression will represent the total number of minutes a ride takes. Write this expression and label it "total number of minutes a ride takes." \_\_\_\_\_

b. If Joan rode 11 mi., how many min. total did the ride take? \_\_\_\_\_

c. If Joan's ride took a total of 1 h., 42 min., how far did she ride? \_\_\_\_\_

d. How many miles per hour was Joan pedalling? \_\_\_\_\_

# SKILLS PRACTICE 34

## Chapter 4 Review

### Harder Equations

NAME \_\_\_\_\_

DATE \_\_\_\_\_

Solve each of the following equations. Round decimal answers to 2 decimal places.

1.  $5x - 7x = 144$  \_\_\_\_\_

2.  $4x - 4 + 5x = 77$  \_\_\_\_\_

3.  $2(x - 5) + 5x = 67$  \_\_\_\_\_

4.  $x + 3(8 - 2x) = -31$  \_\_\_\_\_

5.  $9x - (7 - x) = -67$  \_\_\_\_\_

6.  $8x + 31 = 5x - 41$  \_\_\_\_\_

7.  $2(3x - 4) - x = 3x - 24$  \_\_\_\_\_

8.  $4 - (x - 3) = x + 7$  \_\_\_\_\_

9.  $5 - (4 - 2x) = 2x + 8$  \_\_\_\_\_

10.  $2(3x - 4) - 10 = -15 + 3(2x - 1)$  \_\_\_\_\_

11.  $1.2(3.1x - 4.5) + 8.9 = 3.6x - 7.8$  \_\_\_\_\_

12. During a local triathlon competition, Jay finished his swimming portion 5 minutes before his nearest competitor, Bill. Therefore, on the next portion, bicycling, Jay started riding 5 minutes before Bill. Jay averaged 0.25 miles per minute on his bicycle ride while Bill averaged 0.3 miles per minute.

Let  $x$  be the number of minutes Jay has been riding in the competition.

- a. i. Write an expression for the number of miles Jay has ridden after  $x$  minutes. \_\_\_\_\_  
ii. Write an expression, in terms of  $x$ , for the number of minutes Bill has been riding. \_\_\_\_\_  
iii. Write an expression for the number of miles Bill has ridden since Jay started. \_\_\_\_\_
- b. i. Who is ahead after Jay has been riding for 8 minutes? How far ahead? \_\_\_\_\_  
ii. Who is ahead after Jay has been riding for 36 minutes? How far ahead? \_\_\_\_\_
- c. How many minutes will Jay have to ride before Bill catches him? \_\_\_\_\_
- d. If the bicycling portion of the race is 24 miles, who will complete this portion first, Jay or Bill? How many more minutes will it take the other one to finish? \_\_\_\_\_

13. Olivia and Chad were at adjacent typewriters while practicing their typing. Olivia averages 45 words per minute, while Chad averages 36 words per minute. When Olivia started typing, Chad had already typed 90 words. Let  $x$  be the number of minutes passed since Olivia started typing.

- a. i. Write an expression for the number of words Olivia has typed in  $x$  minutes. \_\_\_\_\_  
ii. Write an expression, in terms of  $x$ , for the number of words Chad has typed (including the words typed before Olivia joined him). \_\_\_\_\_
- b. If Olivia has typed for 5 minutes, how many words have each of them typed? \_\_\_\_\_
- c. How many minutes did Olivia type before she typed the same number of words as Chad? \_\_\_\_\_

**SKILLS PRACTICE 46**  
Chapter 5 Review  
Some Operations with Polynomials  
and Radicals

NAME \_\_\_\_\_

DATE \_\_\_\_\_

1. a. Write an example of an expression which is a polynomial.

b. Write an example of an expression which is not a polynomial.

Name the polynomial by degree and number of terms.

2.  $x^2 - 3x + 5$  \_\_\_\_\_

3.  $x + 5$  \_\_\_\_\_

4.  $x^2$  \_\_\_\_\_

5.  $x^3 - 4x^2 + 7x - 9$  \_\_\_\_\_

Simplify by multiplying and adding common terms.

6.  $(x + 3)(x - 2)$  \_\_\_\_\_

7.  $(3x + 1)(2x + 3)$  \_\_\_\_\_

8.  $(4x - 1)^2$  \_\_\_\_\_

9.  $(6x + 1)(6x - 1)$  \_\_\_\_\_

10.  $(3x - 5)(4x + 3)$  \_\_\_\_\_

11.  $(x + 1)^2$  \_\_\_\_\_

12.  $(x - 1)^2$  \_\_\_\_\_

13.  $(x + 1)(x - 1)$  \_\_\_\_\_

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

15.  $(3x - 2)^2$  \_\_\_\_\_

Factor. If prime, so state.

16.  $x^2 + x - 6$  \_\_\_\_\_

17.  $2x^2 - 7x - 4$  \_\_\_\_\_

18.  $25x^2 - 10x - 3$  \_\_\_\_\_

19.  $x^2 - 5x + 6$  \_\_\_\_\_

20.  $x^2 - 6x + 9$  \_\_\_\_\_

21.  $x^2 + 1$  \_\_\_\_\_

22.  $x^2 - 1$  \_\_\_\_\_

23.  $x^2 - 2x + 1$  \_\_\_\_\_

24.  $x^2 + 2x - 1$  \_\_\_\_\_

25.  $9x^2 - 16$  \_\_\_\_\_

26.  $4x^2 + 4x - 3$  \_\_\_\_\_

27.  $x^2 + 9x - 10$  \_\_\_\_\_

28.  $x^2 - 9x + 10$  \_\_\_\_\_

29.  $6x^2 + x - 1$  \_\_\_\_\_

30.  $4x^2 - 21x + 5$  \_\_\_\_\_

31.  $x^2 + 10x + 25$  \_\_\_\_\_

32.  $x^2 - 25$  \_\_\_\_\_

33.  $x^2 - 4x + 4$  \_\_\_\_\_

34.  $x^2 - 4$  \_\_\_\_\_

35.  $x^2 + x - 2$  \_\_\_\_\_

36. State whether each of the following numbers are rational, irrational, or neither.

a. 4 \_\_\_\_\_

b.  $\sqrt{4}$  \_\_\_\_\_

c. 14 \_\_\_\_\_

d.  $\sqrt{14}$  \_\_\_\_\_

# SKILLS PRACTICE 56

Chapter 6 Review  
Quadratic Equations

NAME \_\_\_\_\_

DATE \_\_\_\_\_

Solve without the use of the quadratic formula.

1.  $|x - 6| = 9$  \_\_\_\_\_

2.  $|4x + 1| = 33$  \_\_\_\_\_

Solve by using the quadratic formula.

12.  $x^2 + 7x + 12 = 0$  \_\_\_\_\_

13.  $2x^2 - 3x + 1 = 0$  \_\_\_\_\_

14.  $3x^2 + 4x - 9 = 0$  \_\_\_\_\_

15.  $6x^2 - 3x + 1 = 0$  \_\_\_\_\_

16.  $x^2 - 8x = -12$  \_\_\_\_\_

**SKILLS PRACTICE 60**  
For use with Section 7-3  
Graphs of Equations Containing  
Two Variables

NAME \_\_\_\_\_

DATE \_\_\_\_\_

Draw a graph of the indicated set of points. Connect the points with a straight line.

1.  $\begin{array}{cc} x & y \\ -2 & -8 \\ 0 & -4 \\ 1 & -2 \\ 3 & 2 \end{array}$

2.  $\begin{array}{cc} x & y \\ -1 & 4 \\ 0 & 1 \\ 1 & -2 \\ 3 & -8 \end{array}$

3. If you read the graphs of Problems 1 and 2 from left to right, how do they differ? Which one would you describe as uphill?  
\_\_\_\_\_
4. How many points do you need to plot before you can graph a line?  
\_\_\_\_\_

For Problems 5-9, solve for  $y$  in terms of  $x$ . That means, isolate  $y$ .  
(Please do not use decimals for fractional values.)

5.  $3x + y = 1$  \_\_\_\_\_

6.  $2x - y = 4$  \_\_\_\_\_

7.  $3x + 4y = 12$  \_\_\_\_\_

8.  $2x - 3y = 9$  \_\_\_\_\_

9.  $x + 2y = 0$  \_\_\_\_\_

10. Give four ordered pairs which are solutions to the equation  
 $3x + y = 1$ .  
\_\_\_\_\_

For each equation in Exercises 11-14

- a. Pick four convenient values for  $x$  and evaluate  $y$  depending on the selected values of  $x$ .  
\_\_\_\_\_

- b. Plot the ordered pairs of  $x$  and  $y$ . \_\_\_\_\_

- c. Connect the ordered pairs with a straight line. \_\_\_\_\_

11.  $y = 2x - 4$  \_\_\_\_\_

12.  $y = -3x + 1$  \_\_\_\_\_

13.  $y = -\frac{3}{4}x + 12$  (Hint: Use multiples of 4 for values of  $x$ .)  
\_\_\_\_\_

14.  $y = 2x$  \_\_\_\_\_

15. For the equation  $2x - 3y = 6$ , first solve for  $y$  in terms of  $x$  then graph the line using the procedure described for Problems 11-14.

16. Evaluate  $2x - 3y$  for

a.  $x = 6$  and  $y = 2$  \_\_\_\_\_

b.  $x = -3$  and  $y = -4$  \_\_\_\_\_

# SKILLS PRACTICE 62

For use with Section 7-5

Slope and Rapid Graphing

NAME \_\_\_\_\_

DATE \_\_\_\_\_

- Plot the two given points and graph the line containing them.
- Count the rise and the run between the two points.
- Write the slope as the ratio of the rise over the run.
- Use the slope to find a third point on the line.

1.  $(-2, 2), (3, 4)$  \_\_\_\_\_

2.  $(-3, -1), (-2, -5)$  \_\_\_\_\_

3.  $(-1, -2), (1, 2)$  \_\_\_\_\_

4.  $(2, 1), (8, -2)$  \_\_\_\_\_

- State the slope.
- State the  $y$ -intercept.
- Plot the line using the slope and  $y$ -intercept.

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

6.  $y = -\frac{1}{2}x + 5$  \_\_\_\_\_

7.  $y = -x + 3$  \_\_\_\_\_

8.  $y = -4x - 2$  \_\_\_\_\_

9.  $y = x$  \_\_\_\_\_

10.  $y = 2x - 6$  \_\_\_\_\_

- Solve for  $y$  in terms of  $x$  (isolate  $y$ ).
- State the slope and  $y$ -intercept.
- Plot the line using the slope and  $y$ -intercept.

11.  $2x + 3y = 6$  \_\_\_\_\_

12.  $3x - 4y = -12$  \_\_\_\_\_

13.  $x - y = 6$  \_\_\_\_\_

14.  $x + 2y = 0$  \_\_\_\_\_

- State the  $x$ - and  $y$ -intercepts.
- Solve for  $y$  in terms of  $x$ .
- State the slope.
- Plot the line using the intercepts and check.

15.  $3x - 5y = 15$  \_\_\_\_\_

16.  $x + 2y = -8$  \_\_\_\_\_

17.  $4x - 6y = -24$  \_\_\_\_\_

18.  $x - y = 5$  \_\_\_\_\_

If  $y = mx + b$  where  $m$  is the slope and  $b$  is the  $y$ -intercept of the line, write an equation of a line with the given slope and  $y$ -intercept.

19. slope is  $\frac{2}{3}$ ,  $y$ -intercept is  $-5$  \_\_\_\_\_

20. slope is  $-4$ ,  $y$ -intercept is  $3$  \_\_\_\_\_

Factor.

21.  $x^2 - 3x + 2$  \_\_\_\_\_

22.  $x^2 - 25$  \_\_\_\_\_



# SKILLS PRACTICE 67

Review Chapter 7

Expressions and Equations Containing  
Two Variables

NAME \_\_\_\_\_

DATE \_\_\_\_\_

For each of the following systems of equations:

- solve by graphing.
- solve by substitution.
- solve by linear combination (addition-subtraction method).

1.  $2x - y = -3$   
 $3x + y = -2$  \_\_\_\_\_

2.  $x + 3y = 6$   
 $2x - 3y = 3$  \_\_\_\_\_

2.  $5x - 2y = -10$   
 $x + 2y = -2$  \_\_\_\_\_

4.  $y = 3x + 8$   
 $y = -\frac{2}{3}x - 3$  \_\_\_\_\_

5.  $3x - 2y = -6$   
 $x + y = 3$  \_\_\_\_\_

Simplify.

6.  $2x - (3x - 5) + (x + 1)^2$  \_\_\_\_\_

7.  $3x^2 - 2x + 7 - x^2 + 3x + 5$  \_\_\_\_\_

8.  $\frac{4x - 6}{3}$  \_\_\_\_\_

9. Evaluate  $\left(\frac{2}{3}\right)x - \left(\frac{1}{2}\right)y$  if

a.  $x$  is 6 and  $y$  is 4 \_\_\_\_\_

b.  $x$  is 4 and  $y$  is  $-5$  \_\_\_\_\_

10. For the 2 integers 12 and 18,

a. What is the greatest common factor? \_\_\_\_\_

b. What is the least common multiple? \_\_\_\_\_

**SKILLS PRACTICE 80**Chapter 9 Review  
Properties of Exponents

NAME \_\_\_\_\_

DATE \_\_\_\_\_

Simplify. Leave no powers of variables in the denominator. Evaluate all powers of numbers. Do not use decimals. If the expression cannot be simplified, so state.

1.  $x^2x^3$  \_\_\_\_\_

2.  $(x^2)^3$  \_\_\_\_\_

3.  $\frac{x^2}{x^3}$  \_\_\_\_\_

4.  $x^2 + x^3$  \_\_\_\_\_

5.  $2x^4 \cdot 3x^3$  \_\_\_\_\_

6.  $(2x)^3$  \_\_\_\_\_

7.  $(x^3y^{-3})^5$  \_\_\_\_\_

8.  $\frac{8x^6}{2x^4}$  \_\_\_\_\_

9.  $3^{-2}$  \_\_\_\_\_

10.  $(6x^{-2})(-3x^4)$  \_\_\_\_\_

11.  $(2x^2y^3)^3$  \_\_\_\_\_

12.  $\left(\frac{x^3}{y^2}\right)^4$  \_\_\_\_\_

13.  $\left(\frac{2x^{-3}}{y^3}\right)^{-2}$  \_\_\_\_\_

14.  $\frac{x^4y}{xy}$  \_\_\_\_\_

15.  $4x^3 \cdot 2x^3$  \_\_\_\_\_

16.  $4x^3 - 2x^3$  \_\_\_\_\_

17.  $(x^2y^{-4})^5$  \_\_\_\_\_

18.  $(-2x^4)^3$  \_\_\_\_\_

19.  $\frac{x^{-3}y^4}{x^5y^{-2}}$  \_\_\_\_\_

20.  $(5xy^8)^0$  \_\_\_\_\_

Write in scientific notation.

21. 30405 \_\_\_\_\_

22. 0.00091 \_\_\_\_\_

23.  $89.5 \times 10^3$  \_\_\_\_\_

Write in standard notation.

24.  $7.8 \times 10^{-3}$  \_\_\_\_\_

25.  $7.8 \times 10^3$  \_\_\_\_\_

Express the product or quotient in scientific notation.

26.  $(2 \times 10^3)(4 \times 10^{-2})$  \_\_\_\_\_

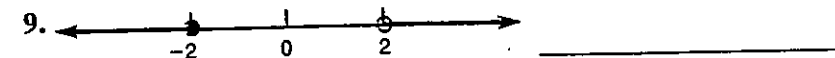
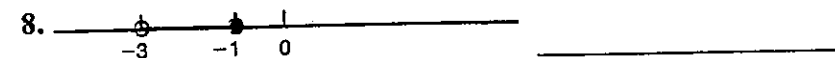
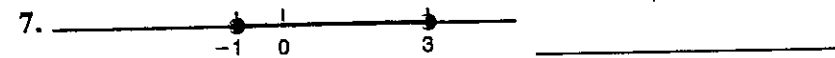
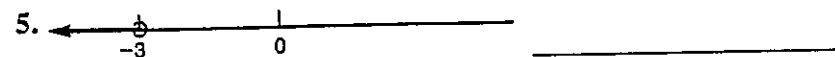
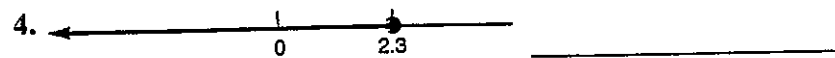
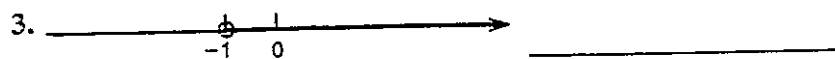
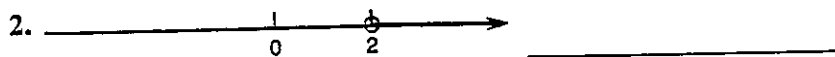
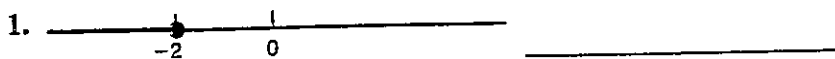
27.  $\frac{4 \times 10^{-2}}{2 \times 10^3}$  \_\_\_\_\_

**SKILLS PRACTICE 114**  
 Chapter 13 Review  
 Inequalities

NAME \_\_\_\_\_

DATE \_\_\_\_\_

Write an inequality which will describe the number line graph.



Solve the inequality and sketch a graph of the solution on a number line.

11.  $2x + 3 \geq 5$

13.  $x - 5 \leq -9$

15.  $-2 < x < 4$

17.  $0 \leq 2x + 1 \leq 3$

19.  $2x + 5 \geq 13$  or  $3x - 1 < -4$

21.  $|x| \geq 4$

23.  $|2x + 1| \leq 7$

25.  $|8x - 5| \leq -5$

12.  $5 - 3x < 8$

14.  $-5 < x + 3 < 9$

16.  $x \geq 5$  or  $x \leq -4$

18.  $-3 < 2 - x < 4$

20.  $x + 8 > 9$  or  $2x - 3 < -9$

22.  $|x| < 5$

24.  $|3 + 4x| > 7$

Draw a graph of the inequality on a Cartesian coordinate plane.

26.  $2x - 3y \leq -12$

27.  $y > 2x - 5$   
 $x + y < 7$

