

**CP Algebra 2**  
**Summer Packet**  
**2018**

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

# Objectives for CP Algebra 2 Summer Packet 2018

## I. Number Sense and Numerical Operations (Problems: 1 to 42)

- Use the Order of Operations to evaluate expressions. (p. 6)
- Evaluate expressions using given values. (p. 7)
- Use formulas. (p. 8)
- Identify properties of real numbers. (p. 13)
- Find the additive and multiplicative inverse of a number. (p. 13)
- Use the properties of real numbers to simplify expressions. (p. 12-14)
- Translate verbal expressions into algebraic expressions. (p. 20)
- Solve equations using the Properties of Equality. (p. 21-22)
- Solve equations for another variable. (p. 22)
- Evaluate expressions involving absolute value. (p. 28)
- Solve inequalities. (p. 33-35)
- Solve compound inequalities. (p. 40-41)

## II. Functions and Relationships (Problems: 43 to 50)

- Find functional values. (p. 59)
- Write linear equations in standard form. (p. 64)
- Graph linear equations using the x-intercept and y-intercept. (p. 65)
- Find the slope of a line. (p. 68-69)
- Graph a line given a point and the slope. (p. 69)
- Graph parallel or perpendicular lines. (p. 70-71)
- Write an equation of a line given the slope and a point on the line. (p. 75-76)
- Write an equation of a line parallel or perpendicular to a given line. (p. 77-78)

**Directions:** Complete each problem, **showing all work in the space provided below the problem.** You **MUST** show work or explain your solution in order to receive credit for the answer. There are hints for each problem in the right hand margin of the page.  
**CIRCLE YOUR ANSWERS!**

**QUESTION**

**HINT**

**Find the value of each expression.**

**Remember Order of Operations:  
PEMDAS**

1.  $4 + 8(4) \div 2 - 10$

Step 1: Simplify parentheses or brackets.

2.  $5 \cdot 7 - 2(5 + 1) \div 3$

Step 2: Evaluate all powers.

Step 3: Do all multiplication and/or division from left to right.

3.  $0.5[7 - (8 - 6)^2] - 1$

Step 4: Do all additions and/or subtraction from left to right.

4.  $\frac{1}{2}(3^2 + 5 \cdot 7) - 8$

5.  $\frac{6^2 + 4(2^4)}{28 + 9 \cdot 8}$

**Evaluate each expression if  $a = -0.5$ ,  $b = 4$ ,  $c = 5$ ,  $d = -3$ .**

Substitute values into the expression, then follow Order of Operations.

6.  $ab^2 + c$

7.  $bc + d \div a$

8.  $7ab - 3d$

## QUESTION

Evaluate each expression if  $a = -0.5$ ,  $b = 4$ ,  $c = 5$ ,  $d = -3$ .

9. 
$$\frac{3ab^2 - d^3}{a}$$

10. The formula  $F = \frac{9}{5}C + 32$  gives the degrees Fahrenheit for a given temperature in degrees Celsius. What is the temperature in degrees Fahrenheit when the temperature is  $-40$  degrees Celsius?

Name the property illustrated by each equation.

11.  $(4 + 9a)2b = 2b(4 + 9a)$

12.  $3\left(\frac{1}{3}\right) = 1$

13.  $a(3 - 2) = a \cdot 3 - a \cdot 2$

14.  $(2a)b = 2(ab)$

15.  $5a + (-5a) = 0$

16. Name the additive inverse and multiplicative inverse for  $-4\frac{3}{5}$ .

## HINT

Substitute values into the expression, then follow Order of Operations.

Substitute the Celsius degrees into the given formula.

**Properties of Real Numbers:**

Commutative

Associative

Identity

Inverse

Distributive

What would you add to the number to get to 0? What would you multiply the number by to get to 1?

**QUESTION****HINT****Simplify each expression.**

Use the Distributive Property and the Order of Operations.

17.  $8(3a - b) + 4(2b - a)$

18.  $8(2.4r - 3.1q) - 6(1.5r + 2.4q)$

19.  $2(15 + 45c) + \frac{5}{6}(12 + 18c)$

20.  $3(4 - 2x + y) - 4(5 + x - y)$

21. A subway train was carrying 103 passengers. At the next three stops, 15 people got on and 9 got off, 27 got on and 13 got off, and 8 got on and 53 got off. How many passengers were then on the train?

**Write an algebraic expression to represent each verbal expression.****Example:** 18 less than the quotient of a number and 3.

22. the sum of six times a number and 25

$$\frac{n}{3} - 18$$

23. 7 less than fifteen times a number

24. four times the square of a number increased by five times the same number

25. the difference of nine times a number and the quotient of 6 and the same number

**QUESTION****HINT****Solve each equation.**

26.  $4z + 11 = 3$

27.  $2(x - 3) = x + 3$

28.  $0.3(2r - 3) = 0.2r + 0.9$

29.  $2m - (1 - m) = 11 - m$

30.  $\frac{6x - 2(x - 4)}{3} = 8$

**Solve each equation or formula for the specified variable.**

31.  $I = prt$ ; for  $p$

32.  $P = 2l + 2w$ ; for  $w$

33.  $ax + by = c$ ; for  $y$

34.  $A = 2\pi r^2 + 2\pi rh$ ; for  $h$

-Use Distributive Property first if needed.

-Combine like terms on each side of the equation.

-Use Addition and Subtraction Properties of Equality to move the variables to one side and the constants to the other.

-Use Multiplication and Division Properties of Equality to isolate the variable.

-Do the same steps that you do for solving an equation with one variable.

**Example:**  $\frac{3pq}{r} = 12$  for  $p$ 

$$r\left(\frac{3pq}{r}\right) = (12)r$$

$$3pq = 12r$$

$$\frac{3pq}{3q} = \frac{12r}{3q}$$

$$p = \frac{12r}{3q}$$

## QUESTION

35. Adam purchased a shirt at regular price. Later, when the shirts were on sale, he purchased two more at \$2 off the regular price. He spent a total of \$41 for the three shirts. What is the regular price of the shirt?

Evaluate each expression if  $w = -4$ ,  $x = 2$ ,  $y = \frac{1}{2}$ , and  $z = -6$ .

36.  $|x + 5| - |2w|$

37.  $|z| - 3|5yz|$

38.  $3|wx| + \frac{1}{4}|4x + 8y|$

Solve each inequality. Then graph the solution set on a number line.

39.  $4(b - 7) + 6 < 22$



## HINT

Choose a variable to represent the regular price and then write an equation to describe the situation. Solve for the variable.

- Substitute the values into the expressions.
- Simplify inside each absolute value sign.
- Find the absolute value of that number.
- Then combine the remaining terms.

Do the same steps that you would do if there were an equal sign. **Remember if you are multiplying or dividing by a negative number you need to reverse the inequality symbol.**

**QUESTION****HINT**

40.  $4x - 2 > -7(4x - 2)$



41.  $-10 < 3x + 2 \leq 14$

Be sure to perform the steps to **each** of the three parts of the inequality.



42.  $\frac{2}{3}b - 2 > 10$  or  $\frac{3}{4}b + 5 < -4$

Solve each inequality, then graph on the same number line.



43. Given  $f(x) = -2x + 3$ ; find  $f(-6)$ .

Substitute -6 in for  $x$  on the right side of the function.

44. Write in standard form.  
Identify  $A$ ,  $B$ , and  $C$ .

a.  $4y + 4x + 12 = 0$

b.  $x = \frac{y}{9} + 7$

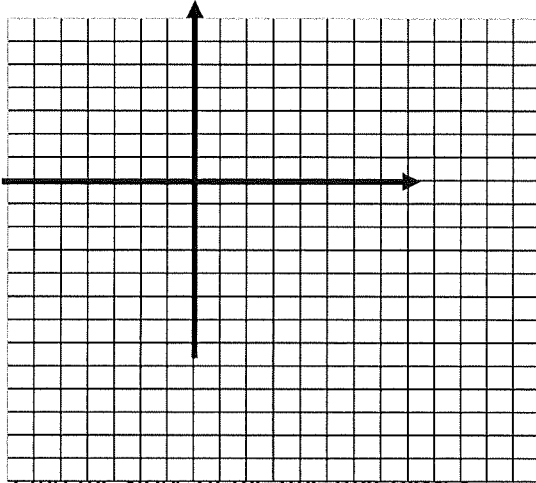
**Standard Form of an Equation:**

$Ax + By = C$  where  $A \geq 0$  (must be a positive number),  $A$  and  $B$  are not both 0, and  $A$ ,  $B$ , and  $C$  are integers (no fractions or decimals) whose greatest common factor is 1.



### QUESTION

45. Find the x-intercept and y-intercept of  $2x + 5y = 10$ . Then graph the equation.



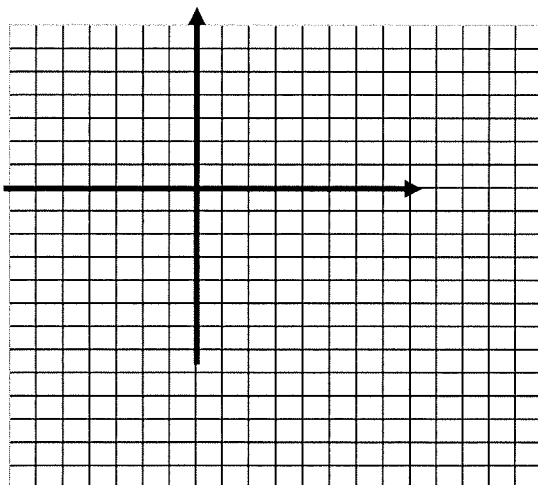
46. Find the slope of the line that passes through each pair of points.

a.  $(4, 5), (2, 7)$

b.  $(5, -3), (-4, 3)$

47. Graph the line passing through the given point with the given slope.

$$(2, -4); m = \frac{2}{3}$$



### HINT

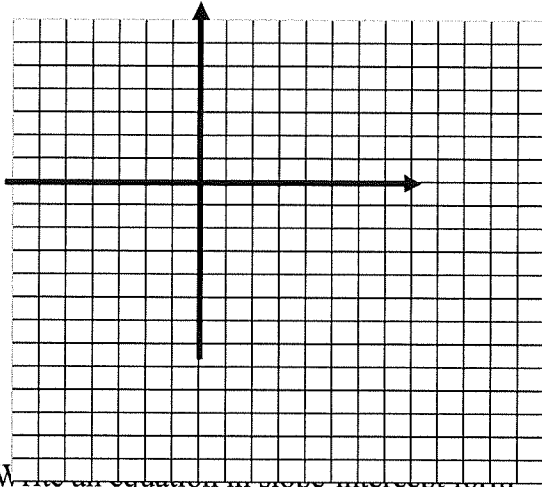
To find x-intercept, substitute 0 in for y. To find y-intercept, substitute 0 in for x. Plot each point then connect the points with a line.

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

Plot the point; use  $\frac{\text{rise}}{\text{run}}$  to get other points. Connect with a line.

## QUESTION

48. Graph the line that satisfies the following conditions:  
passes through  $(0, 1)$  and is perpendicular  
to a line whose slope is  $\frac{1}{3}$ .



49. Write an equation in slope-intercept form  
for the line with slope  $= -2$  and passes  
through  $(-4, 6)$

50. Write an equation of the line that passes  
through  $(-1, 5)$  and is parallel to the graph  
of  $y = 3x + 1$ .

## HINT

Remember, perpendicular slopes  
are negative reciprocals of each other.

Find the perpendicular slope of  $\frac{1}{3}$

then plot the point and use  $\frac{\text{rise}}{\text{run}}$ .

### Slope-Intercept Form of a Line

$$y = mx + b$$

Substitute  $m$ ,  $x$ , and  $y$ ; then solve for  $b$ .  
Remember to substitute the  $b$  back into  
 $y = mx + b$ .

Parallel lines have the **same** slope.

You can use **Slope-Intercept Form**  
from above or **Point-Slope Form of a**

**Line:**  $y - y_1 = m(x - x_1)$