

## Math Summer Enrichment Packet for Algebra II CP and Honors

**Directions:** On the chart below, you will find a list of the problems you are expected to complete over the summer. You will notice that your summer enrichment is divided into seven separate assignments. Ideally you should plan to spread your work out over the course of the summer and complete 1-2 assignments per week. You will also notice that students in CP and Honors level courses have differing requirements. Take careful note of which pages your math level is expected to complete.

Assignment	College Prep	Honors
Section 1	#1-12	#1-12
Section 2	#1-12	#1-14
Section 3	#1-15	#1-20
Section 4	#1-10	#1-12
Section 5	#1-8	#1-12
Section 6	#1-6, #11-13	#3-8, 10-15
Section 7	#1-9	#1-14

**Purpose:** The purpose of our summer math enrichment program is to ensure that the skills, knowledge, and content mastered over the course of the year are retained over the summer. This will help students to be better prepared and ready to succeed in their next math course.

**Grading:** Completion of all the assigned pages/problems will be counted as your first test/project grade of the year. You will be graded upon completion of all the work.

### Where do I complete the assignments?

All problems should be completed on lined paper. Neatness is important in math, so take your time and use a pencil. Show all of your work and clearly number all of the problems.

**Due Date:** The assignment will be due to your teacher on the first day of class.

### What if I struggle with the work?

Parents/guardians and students, please be aware that the math packet does not come with additional examples and/or instructions. Sections of this packet may be challenging for you at times. We suggest that if you run into difficulty with certain concepts and/or problems that you seek out advice from family and friends, previous math tutors, or utilize resources such as Khan Academy. The key is to give the assignment your best effort.

Have a great summer!

We look forward to working with all of you next year.

Best wishes,  
Your Math Department

## Section 1

State the domain and range of each relation. Then determine whether the relation is a function

1.  $\{(2, 7), (3, 10), (1, 6)\}$

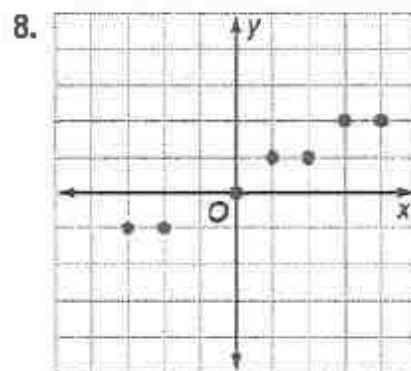
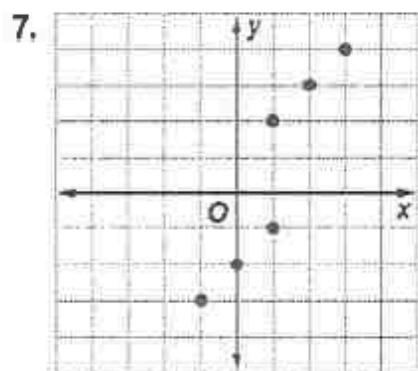
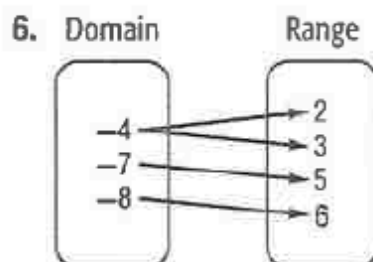
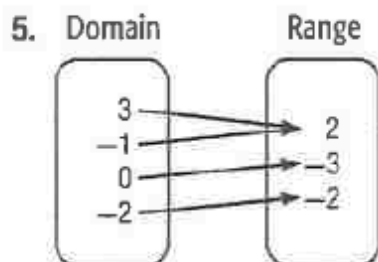
2.  $\{(-6, 0), (5, 5), (9, -2), (-2, -9)\}$

3.

$x$	$y$
1	5
2	7
1	9

4.

$x$	$y$
-12	0
-10	1
-8	2
-6	4



For #9-12, Name the quadrant for which each point is located.

9.  $(5, 3)$

10.  $(8, -6)$

11.  $(2, 0)$

12.  $(-7, -1)$

## Section 2

Find each product.

1.  $(a + 2)(a + 4)$

2.  $(v - 7)(v - 1)$

3.  $(h + 4)(h - 4)$

4.  $(d - 1)(d + 1)$

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

6.  $(t - 9)(t + 11)$

7.  $(r + 3)(r - 8)$

8.  $(k - 2)(k + 5)$

9.  $(2c + 1)(c - 5)$

10.  $(3m + 4)(2m - 5)$

11.  $(5g + 1)(6g + 9)$

12.  $(2q - 17)(q + 2)$

13. I am thinking of two integers. One is 7 less than a number, and the other is 2 greater than the same number.

a) Write expressions for the two numbers

b) Write a polynomial expression for the product of the numbers

14. Michael's office is a square. His office in the company's new building will be 3 feet wider and 5 feet longer.

a) Write an expression for the dimensions of Michael's new office.

b) Write a polynomial expression for the area of Michael's new office

c) Suppose Michael's current office is 7 feet by 7 feet. How much longer will his new office be?

## Section 3

Factor completely

1.  $12x^2 + 4x$

2.  $6x^2y + 2x$

3.  $8ab^2 - 12ab$

4.  $x^2 + 5x + 4$

5.  $y^2 + 12y + 27$

6.  $x^2 + 6x + 8$

7.  $x^2 - 5x + 6$

8.  $y^2 - 5y + 4$

9.  $6x^2 - 13x + 5$

10.  $11x^2 - 78x + 7$

11.  $9x^2 - 24x + 16$

12.  $4a^2 + 12ab + 9b^2$

13.  $x^2 - 144$

14.  $4c^2 - 9$

15.  $16y^2 - 1$

16.  $36y^2 - 16$

17.  $x^2 + 4xy + 4y^2$

18.  $18x^2 - 31xy + 6y^2$

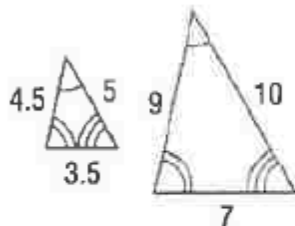
19.  $7x^2 + 51x + 14$

20.  $3x^2 + 28x + 32$

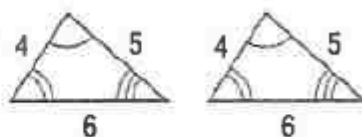
## Section 4

Determine whether each pair of figures is *similar*, *congruent*, or *neither*.

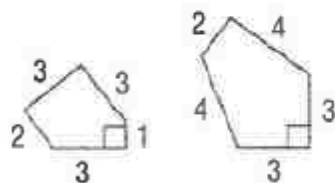
1.



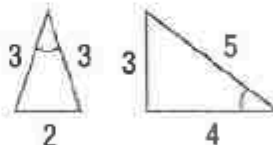
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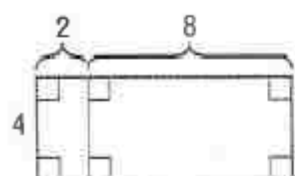
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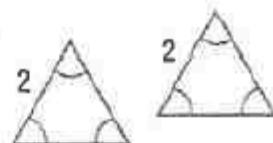
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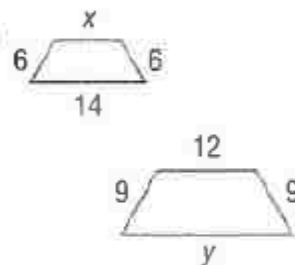


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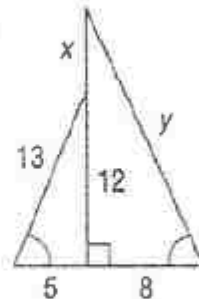


Each pair of polygons is similar. Find the values of  $x$  and  $y$ .

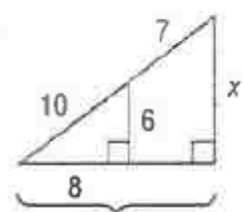
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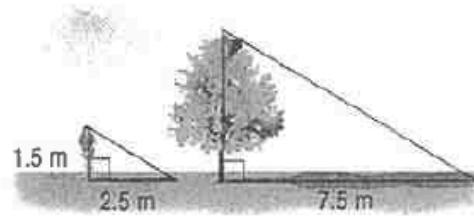
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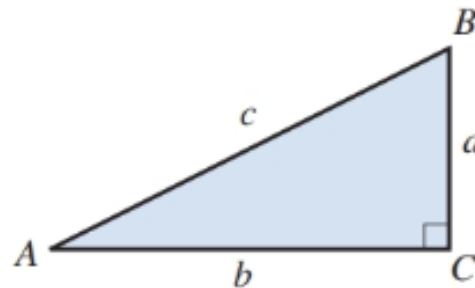
10. **SHADOWS** On a sunny day, Jason measures the length of his shadow and the length of a tree's shadow. Use the figures to find the height of the tree.



11. **PHOTOGRAPHY** A photo that is 4 inches wide by 6 inches long must be reduced to fit in a space 3 inches wide. How long will the reduced photo be?
12. **SURVEYING** Surveyors use instruments to measure objects that are too large or too far away to measure by hand. They can use the shadows that objects cast to find the height of the objects without measuring them. A surveyor finds that a telephone pole that is 25 feet tall is casting a shadow 20 feet long. A nearby building is casting a shadow 52 feet long. What is the height of the building?

## Section 5

For  $\triangle ABC$  find the missing measure



- |                                |                                  |                                  |
|--------------------------------|----------------------------------|----------------------------------|
| 1. $a = ?$ , $b = 4$ , $c = ?$ | 2. $a = ?$ , $b = 12$ , $c = 13$ | 3. $a = 14$ , $b = ?$ , $c = 50$ |
| 4. $a = 2$ , $b = 9$ , $c = ?$ | 5. $a = ?$ , $b = 7$ , $c = 11$  |                                  |

The lengths of three sides of a triangle are given. Determine whether each triangle is a right triangle.

- |                     |                     |                   |
|---------------------|---------------------|-------------------|
| 6. 5in, 7 in, 8 in  | 7. 9m, 12m, 15m     | 8. 6cm, 7cm, 12cm |
| 9. 10yd, 24yd, 26yd | 10. 11km, 60km, 6km |                   |

11. If a flagpole is 30 feet tall and Pam is standing a distance of 15 feet from the flagpole, what is the distance from her feet to the top of the flagpole?

12. The walls of a recreation center s being covered with paneling. A doorway is 0.9 meter wide and 2.5 meters high. What is the length of the widest rectangular panel that can be taken through the doorway?

## Section 6

Evaluate each expression if  $a = -2$ ,  $b = 3$  and  $c = 4.2$ .

1.  $a - 2b + 3c$

2.  $2a + (b + 3)^2$

3.  $a + 3[b^2 - (a + c)]$

4.  $5c - 2[(b - a) + c]$

5.  $4(2a + 3b) - 2c$

6.  $\frac{a^2 + 4c}{3b + 2a}$

7.  $\frac{b^3 + ac}{ab + 2bc}$

8.  $\frac{3b + 2a}{5 - c}$

9.  $\frac{3a - 2c}{4ab}$

Evaluate each expression if  $w = -3$ ,  $x = 4$ ,  $y = 2$  and  $z = \frac{1}{3}$

10.  $y + x - z$

11.  $w - 2x + y \div 2$

12.  $4(x - w)$

13.  $6(y + x)$

14.  $9z - 4y + 2w$

15.  $3y - 4z + x$

## Section 7

**Write an algebraic expression to represent each verbal expression.**

1. The product of 12 and the sum of a number and negative three.
2. The difference between the product of four and a number and the square of the number.

**Solve each equation.**

3.  $z - 19 = 34$

4.  $x + 13 = 7$

5.  $-y = 8$

6.  $-6x = 42$

7.  $5x - 3 = -33$

8.  $-6y - 8 = 16$

9.  $3(2a + 3) - 4(3a - 6) = 15$

10.  $5(c - 8) - 3(2c + 12) = -84$

11.  $-3(-2x + 20) + 8(x + 12) = 92$

12.  $-4(3m - 10) - 6(-7m - 6) = -74$

**Solve each equation for the given variable**

13.  $8r - 5q = 3$ , for  $q$

14.  $PV = nrt$ , for  $n$