

Honors Geometry Maintenance Assignment

Welcome to Honors Geometry! In order to ensure success in this course, there is a mandatory summer assignment packet. This packet is due on the first day of your math class whether it occurs in first or second semester. While it is best to not put the assignment off to the last minute, you want to complete the assignment close enough to the start of your course so that the ideas are fresh. There will be an assessment on this material the first week of class, after the packet has been reviewed.

All topics in this assignment should be a review. You should not only be familiar with the topics but you should know them well enough to be tested on them. This is material that will not be taught in the course. It is expected that you come in with a strong understanding of these topics. If you are unsure of how to do these problems, feel free to seek help with them. There are many websites with helpful videos including Khan Academy, YouTube, mathisfun.com, purplemath.com., shmoop.com, and algebrahelp.com.

Give us your best work while giving yourself the opportunity to get off to a great start! We look forward to having you in class!!

Sincerely,
The Math Department

ALL PROBLEMS SHOULD BE SOLVED ON A SEPARATE SHEET OF LOOSE LEAF PAPER AND ALL WORK MUST BE SHOWN

Section 1 – Solving Linear Equations in One Variable

Example:

$$4x - 2(1 - x) = -38$$

$$4x - 2 + 2x = -38$$

$$6x - 2 = -38$$

$$6x = -36$$

$$x = -6$$

Problems:

1.) $4x + 5 + 5x + 40 = 0$

2.) $1.7(x + 5) = 2.1x + 9.7$

3.) $2(4x + 4) = x + 1$

4.) $2(x + 5) = 3(x - 2)$

5.) $\frac{1}{2}(6 + 4x) - \frac{1}{4}(8x - 12) = \frac{1}{2}(2x - 4)$

6.) $5x - [7 - (2x - 1)] = 3(x - 5) + (x + 3)$

7.) $-7 + 3n + 11 = 6n + 5 - 3n$

8.) $\frac{1}{2x} + \frac{4}{5} = \frac{5}{6x} + \frac{1}{45}$

Section 2 – Solving Equations by Factoring

Example:

$$3x^2 + 14x + 8 = 0$$

$$(3x + 2)(x + 4) = 0$$

$$3x + 2 = 0 \text{ or } x + 4 = 0$$

$$x = -\frac{2}{3} \text{ or } x = -4$$

Problems:

1.) $x^2 + 5x - 6 = 0$

2.) $x^2 = 20x - 36$

3.) $3x^2 - 13x - 10 = 0$

4.) $6x^2 + 11x - 60 = 0$

5.) $x^2 = 3x$

Section 3 – Simplifying Rational Expressions

Example:

$$\sqrt{56} = \sqrt{4 \times 14} = 2\sqrt{14}$$

$$\sqrt{\frac{7}{3}} = \frac{\sqrt{7}}{\sqrt{3}} = \frac{\sqrt{7} \times \sqrt{3}}{\sqrt{3} \times \sqrt{3}} = \frac{\sqrt{21}}{3}$$

$$(3\sqrt{7})^2 = 3^2 \times \sqrt{7}^2 = 9 \times 7 = 63$$

Problems:

1.) $\sqrt{24}$

2.) $\sqrt{300}$

3.) $\sqrt{\frac{1}{4}}$

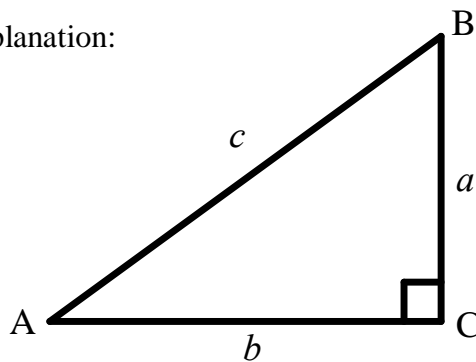
4.) $\sqrt{\frac{3}{5}}$

5.) $\sqrt{\frac{250}{48}}$

6.) $(4\sqrt{5})^2$

Section 4 – Pythagorean Theorem

Explanation:



$$a^2 + b^2 = c^2$$

Problems:

1.) $a = 3, b = 4, c = ?$

2.) $a = 5, b = ?, c = 13$

3.) $a = 5, b = 5, c = ?$

4.) $a = ?, b = 7\sqrt{3}, c = 14$

5.) $a = 6, b = ?, c = 9$

6.) $a = 13, b = 17, c = ?$

Section 5 – Solving Proportions

Example:

$$\frac{x + 4}{5} = \frac{x - 2}{3}$$

$$5(x - 2) = 3(x + 4)$$

$$5x - 10 = 3x + 12$$

$$2x = 22$$

$$x = 11$$

Problems:

$$1.) \frac{7}{3} = \frac{21}{x}$$

$$2.) \frac{10}{6x + 7} = \frac{6}{2x + 9}$$

$$3.) \frac{2 - 4x}{-6} = \frac{6x - 8}{10}$$

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

Section 6 – Systems of Equations

Using the Substitution Method

Example: Solve the system using the substitution method.

$$y = 3x$$

$$x + y = -32 \quad \text{--- -->} \quad x + (3x) = -32$$

$$4x = -32$$

$$x = -8$$

$$y = 3(-8)$$

$$y = -24$$

Solution: (-8, -24)

Problems:

$$1.) \quad \begin{aligned} y &= x + 1 \\ -2x + y &= 7 \end{aligned}$$

$$2.) \quad \begin{aligned} 3y + 4x &= 15 \\ 2x + y &= -3 \end{aligned}$$

Using the Elimination Method

Example: Solve the system using the elimination method.

$$2x + 5y = 17$$

$$\underline{6x - 5y = -9}$$

$$8x = 8$$

$$x = 1 \text{ ---} \rightarrow 2(1) + 5y = 17, \text{ so } y = 3$$

solution (1, 3)

Problems:

1.) $5x - 6y = -32$
 $3x + 6y = 48$

2.) $3x + 2y = 1$
 $4x + 3y = -2$

Solve by any algebraic method you choose:

3.) $2x + 37 = 9$
 $x + 5y = 8$

4.) $9x + 8y = 15$
 $9x + 8y = 30$

5.) $4x - 8y = 15$
 $-5x + 10y = -30$

6.) $4x - 7y = 15$
 $-8x + 14y = -30$

Section 7 – Quadratic Formula

Explanation: To solve $ax^2 + bx + c = 0$, the quadratic formula is $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$.

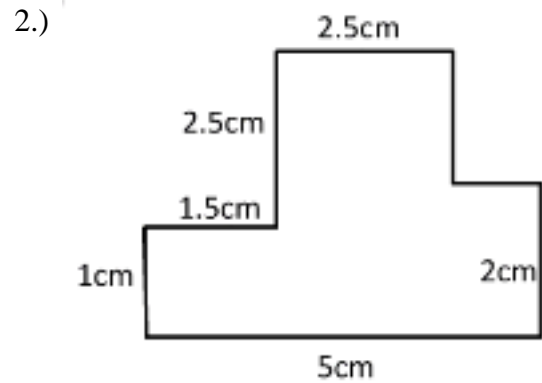
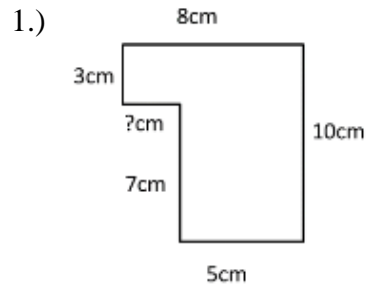
Problems:

1.) $3x^2 + 5x - 7 = 0$

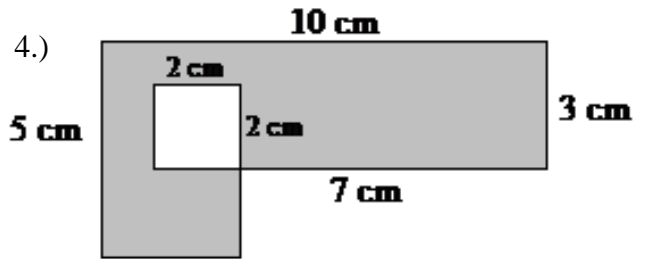
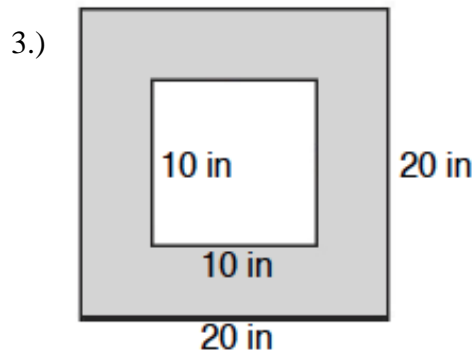
2.) $2x^2 - 5x + 1 = 0$

Section 8 – Perimeter and Area

Find the area and perimeter of each figure.



Find the area of the shaded region in each figure.



- 5.) A rectangular lawn measuring 8 m by 4 m is surrounded by a flower bed of uniform width. The combined area of the lawn and the flowerbed is 165 m². What is the width of the flowerbed?



- 6.) A rectangle has a length that is 2 less than 3 times the width. If the area of this rectangle is 16, find the dimensions and the perimeter.
- 7.) A mural is to be painted on a wall that is 15m long and 12 m high. A border of uniform width is to surround the mural. If the mural is to cover 75% of the area of the wall, how wide must the border be, to the nearest tenth of a meter?