



Summer Math Packet – Geometry

You should complete this packet if you are entering Geometry in 2026.

The Middle School Math Department is asking you to do summer math to make the transition back to class easier for you. **Please complete this packet throughout the summer, ideally as a review during the last few weeks before school starts.** Check the answers that are available to you at the end of the packet. If you find that you need the answer sheet to answer the questions, then you may want to review that concept before school begins. Your teacher will spend little time reviewing the skills and concepts in this packet. Expect a quiz on this in the first week of school. Good luck and see you in August!

Instructions:

1. Use a pencil.
2. Do all of your work on separate paper. Copy the problem onto your paper. To save paper, you do not have to print this packet unless you want to. We will only collect your work.
3. Show your work, even if you are capable of doing it in your head. Show us your steps and thought process on paper. Just writing an answer is not sufficient for most problems.
4. Check your answers with the back of the packet. If any problems are incorrect, put an X through your incorrect work (but do not erase it) and rework the problem again.
5. The packet must be completed and brought to class by the second day of school to be graded. This will count as an assignment. Since most answers are provided, it will mostly be graded on thoroughness of showing your work, neatness, and following directions.

Algebra Review

This section is intended as a review of skills necessary for success in geometry. If you struggle with this material seek help during the summer and let your teacher know within the first week of class.

Section 1: Solving Equations

Show your work neatly. Answers that are fractions should be left as fractions and simplified (improper fractions are best). Answers that are radicals should be written in simplest radical form.

1) $9x - (7 - x) = -67$

3) $2(3x - 4) - x = 3x - 24$

5) $2(3x - 4) - 10 = -15 + 3(2x - 1)$

2) $\frac{1}{2}(8x + 30) = 5x - 41$

4) $5 - (4 - 2x) = 2x + 8$

6) $\frac{2}{(x+5)} = 12$

Section 2: Systems of Equations

Find the solution to each system of equations.

$$1) \begin{cases} x - 4y = 0 \\ x - y = -3 \end{cases}$$

$$2) \begin{cases} y = 3x - 18 \\ y = -2x + 7 \end{cases}$$

$$3) \begin{cases} -3x - 2y = -4 \\ 6x + 4y = 12 \end{cases}$$

4) Brenda's school is selling tickets to a spring musical. On the first day of ticket sales the school sold 3 senior citizen tickets and 9 child tickets for a total of \$75. The school took in \$67 on the second day by selling 8 senior citizen tickets and 5 child tickets. Write a system of equations for this scenario and determine the price of one senior citizen ticket and one child ticket?

5) The perimeter of a rectangular wooden deck is 90 feet. The deck's length, l , is 5 feet less than 4 times its width, w . Write a system of linear equations and use it to determine the dimensions, in feet, of the wooden deck?

Section 3: Proportions

Find the values of a in the following proportions. Show work. **Cross multiply to find your answers.**

$$1) \frac{3}{4} = \frac{a}{15}$$

$$2) \frac{5}{6} = \frac{7.5}{a}$$

$$3) \frac{24}{18} = \frac{a}{6\sqrt{3}}$$

$$4) \frac{5}{4} = \frac{12x}{a}$$

Section 4: Radicals

Write each expression in simplest radical form.

$$1) \sqrt{18}$$

$$7) \sqrt{8} + \sqrt{8}$$

$$12) \frac{3\sqrt{5}}{\sqrt{30}}$$

$$2) \sqrt{32}$$

$$8) \sqrt{18} - \sqrt{8}$$

$$13) \sqrt{125x^7y^4}$$

$$3) \sqrt{192}$$

$$9) 4\sqrt{12} - 5\sqrt{27} + \sqrt{24}$$

$$14) (2 - \sqrt{3})(2 + \sqrt{3})$$

$$4) \sqrt{3} \cdot \sqrt{20}$$

$$10) \frac{3}{\sqrt{4}}$$

$$15) \sqrt{5}(\sqrt{10} + \sqrt{15})$$

$$5) 2\sqrt{5} \cdot 3\sqrt{15}$$

$$11) \frac{\sqrt{2}}{\sqrt{5}}$$

$$6) 3\sqrt{3} - 5\sqrt{3}$$

Section 5: Linear Inequalities

Solve the following inequalities.

1) $-3x - 2 \leq -14$

3) $3x - 5 > x + 7$

5) $2(x - 3) \geq x + 7$

2) $5 - 2x \leq 7$

4) $-1 + x \geq 27 - 6x$

6) $5 - 2(4 - x) > 2x + 3$

Section 6: Graphing and Equations of Lines

1) Graph each line on the given coordinate system. State all relevant information before graphing.

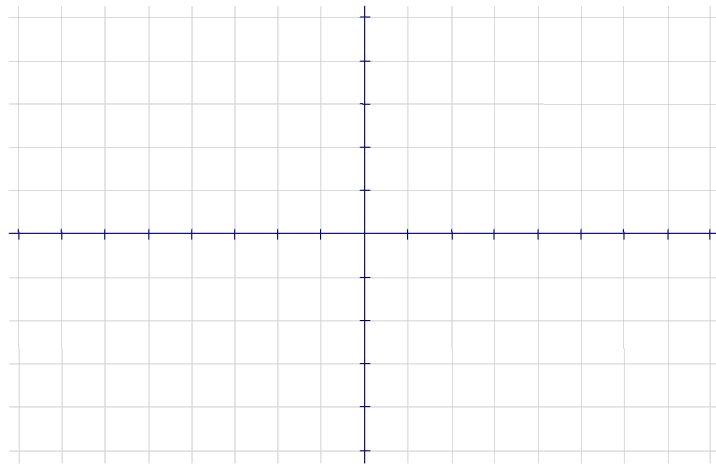
a) $y = 2x - 1$

b) $3x + 2y = 8$

c) $y - 2 = \frac{1}{2}(x + 3)$

d) $y = -3$

e) $x = 2$



2) Determine the equation (in slope-intercept form) of the line that contains the points (5, 9) and (-10, 15).

3) Determine the equation of the line (in slope-intercept form) that is perpendicular to $y = 5x - 7$ and contains the point (-4, 5).

4) Determine the equation of the line that is parallel to the $y = \frac{2}{3}x + 7$ and contains the point (-3, 2).

5) Determine the equation of the line that is perpendicular to the line $y = 5$ and contains the point (-4, 3).

Geometry Preview

This section will introduce you to a few new basic geometric principles as well as review some geometry that you have already learned. Please work to pick up new vocabulary if/when you come across it.

Section 7: Area and Perimeter

Find the area, perimeter or circumference of each figure as indicated. Leave all answers in most accurate form. Be sure to show work as you find an answer.

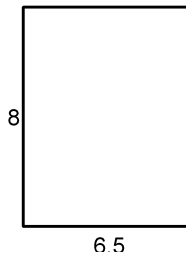
1) Area =

2) Area =

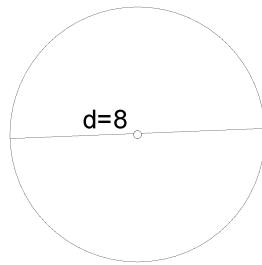
3) Area =

4) Area =

Perimeter =



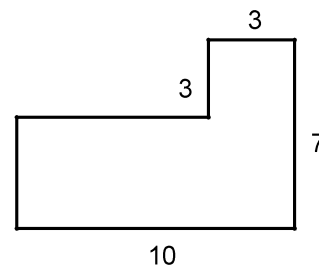
Circumference =



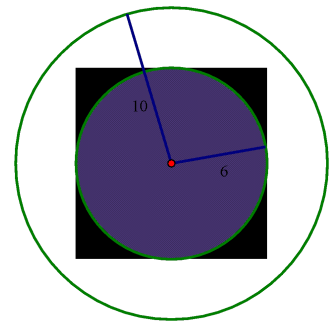
Perimeter:



Perimeter =



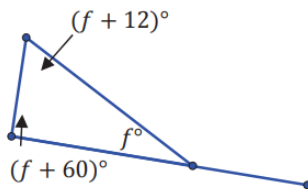
- 5) Find the area of the white region (the region that is the donut shape on the outside). Leave your answer in terms of pi.



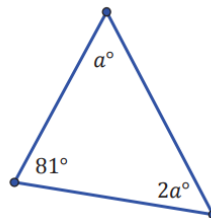
Section 8: Angles and Triangles

The sum of the angles in a triangle is 180° . Find the measure of the missing angle or variable in the triangles below. The images are not drawn to scale.

1)



2)



- 3) A triangle with two angles whose measures are 87° and 52° .
4) A right triangle with one other angle whose measure is 22° .
5) A triangle with one angle measure of 40° and the other two angles have the same measure.
6) A triangle with all three angles having the same measure.

Section 9: Polynomials and Quadratics

1. Multiply:

a. $(x + 4)(x - 7)$

b. $(3x - 6)(x - 2)$

c. $(x + 3)(x^2 + 5x - 9)$

2. Factor:

a. $x^2 + 2x - 63$

b. $x^2 + 13x + 40$

c. $2x^2 + 5x - 12$

3. Identify the axis of symmetry and vertex:

a. $y = x^2 - 6x + 7$

b. $y = 4x^2 + 16x - 3$

4. Find the roots:

a. $y = x^2 + 7x + 12$

b. $y = 2x^2 - 3x + 1$

c. $y = x^2 + 2x - 4$

5. An object is launched directly upward at 64 feet per second (ft/s) from a platform 80 feet high. The object's trajectory follows the equation $h = -16t^2 + 64t + 80$.

a. What will be the object's maximum height? When will it attain this height?

b. How long will it take before the object hits the ground?

Geometry Summer Packet Answers

Solving Equations

1. $x = -6$
2. $x = 56$
3. $x = -8$
4. no solution
5. all real numbers
6. $-\frac{29}{6}$

Systems of Equations

1. $(-4, -1)$
2. $(5, -3)$
3. no solution
4. 4 senior tickets, 7 child tickets
5. $w = 10\text{ft}$

Proportions

1. $a = \frac{45}{4}$
2. $a = 9$
3. $a = 8\sqrt{3}$
4. $a = \frac{48x}{5}$

Radicals

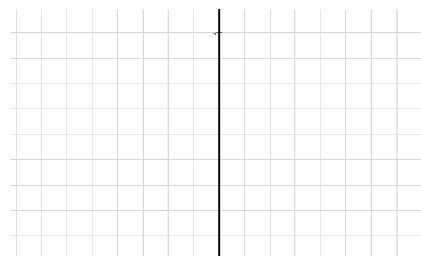
1. $3\sqrt{2}$
2. $4\sqrt{2}$
3. $8\sqrt{3}$
4. $2\sqrt{15}$
5. $30\sqrt{3}$
6. $-2\sqrt{3}$
7. $4\sqrt{2}$
8. $\sqrt{2}$
9. $2\sqrt{6} - 7\sqrt{3}$
10. $\frac{3}{2}$
11. $\frac{\sqrt{10}}{5}$
12. $\frac{\sqrt{6}}{2}$
13. $5x^3 y^2 \sqrt{5x}$
14. 1
15. $5\sqrt{2} + 5\sqrt{3}$

Linear Inequalities

1. $x \geq 4$
2. $x \geq -1$
3. $x > 6$
4. $x \geq 4$
5. $x \geq 13$
6. no solution

Graphing and Equations of Lines

1.



2. $y = -\frac{2}{5}x + 11$
3. $y = -\frac{1}{5}x + \frac{21}{5}$
4. $y = \frac{2}{3}x + 4$
5. $x = -4$

Area and Perimeter

1. $A=52$ sq. units,
 $P=29$ units
2. $C=8\pi$ units,
 $A=16\pi$ sq. units
3. $A=22.5$ sq. units
 $P=14 + \sqrt{106}$ units
4. $A=49$ sq. units,
 $P=34$ units
5. $A=64\pi$ sq. units

Angles & Triangles

1. $f = 36$
2. $a = 33$
3. 41°
4. 68°
5. 70°
6. 60°

2. a. $(x+9)(x-7)$
b. $(x+5)(x+8)$
c. $(2x-3)(x+4)$
3. a. AoS: $x=3$ Vertex $= (3, -2)$
b. AoS: $x=-2$ Vertex $= (-2, -19)$
4. a. $x=-3, x=-4$
b. $x=1, x=\frac{1}{2}$
c. $x = -1 \pm \sqrt{5}$

Polynomials and Quadratics

1. a. $x^2 - 3x - 28$
b. $3x^2 - 12x + 12$
c. $x^3 + 8x^2 + 6x - 27$
5. a. 144 ft after 2 seconds
b. 5 second