

**SAINT DOMINIC ACADEMY**  
**MATHEMATICS DEPARTMENT**



**ENTERING PRECALCULUS/PRECALCULUS HONORS**  
**2025 SUMMER PACKET**

**DIRECTIONS**

Solve all problems. Show all necessary and complete work in PENCIL.  
Write legibly and as neatly as possible.

Cheating is prohibited.

**CALCULATOR IS NOT ALLOWED**

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

Signature: \_\_\_\_\_

# PRECALCULUS/ PRECALCULUS HONORS

## Summer Assignment

*Please print this packet using both sides of the paper.*

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

Welcome to Precalculus/Precalculus Honors! In this course you will be presented with mathematical tasks that require the application of previous course work in new and unfamiliar situations. The problems in this packet were selected to provide a sampling of concepts, skills, and solution methods with which you have experience from previous courses. Complete this packet on your own. However, you may collaborate with your peers, but be aware of your area(s) of weakness and take time to fully review the topic(s) (versus simply completing the problem.) You may find these websites useful:

<http://www.purplemath.com/modules/index.htm>

<http://www.khanacademy.org/#browse>

This packet is due on the first day of school in September. The purpose of this is to provide you feedback on your understanding of these topics and for me to know what level of algebra skills do you have.

This packet should be completed without the use of a calculator unless otherwise stated and **must use pencil only**. Use your calculator as a tool to verify answers when applicable. On this packet,  $x$  and  $y$  represent complex variables unless indicated otherwise. You must use the space provided for your work. Do not attempt to write your answers outside of this packet otherwise it will **NOT** be accepted.

Enjoy the rest of the summer while doing this Algebra II Review Packet.

*Mrs. Patiak*

**TOPIC A: SOLVING EQUATIONS**

*Solve the following equations and identify any extraneous roots if exists.*

1.  $\frac{10}{x} + 3 = \frac{x + 9}{x - 4}$

---

2.  $(2x - 1)(x - 1) = (x - 5)(2x - 5)$

---

3.  $t^3 = 9t^2$

---

4.  $\sqrt{x^2 + 9} - \sqrt{x} = 3$

---

**TOPIC B: SOLVING QUADRATIC EQUATIONS**

*Solve the following quadratic equations using any method.*

1.  $2y^2 - y - \frac{1}{2} = 0$

---

2.  $x^2 - \sqrt{5}x + 1 = 0$

---

3.  $\sqrt{6}x^2 + 2x - \sqrt{3/2} = 0$

---

4.  $25x^2 + 70x + 49 = 0$

---

---

**TOPIC C: SOLVING INEQUALITIES**

*Solve the following inequalities and write your solution in interval notations.*

1.  $|x + 2| \geq 15$

---

2.  $|2x + 3| < 12$

---

3.  $x^2 > 16$

---

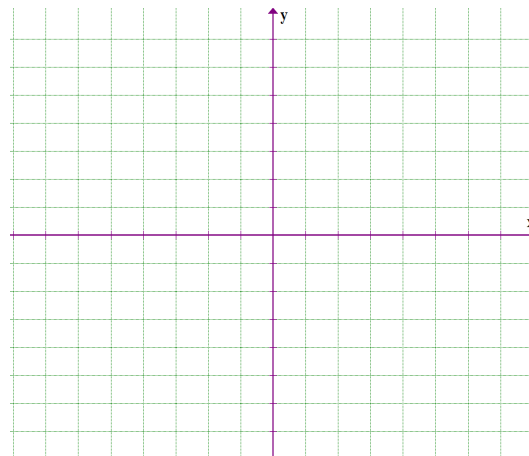
4.  $\frac{x + 3}{x - 4} < 0$

---

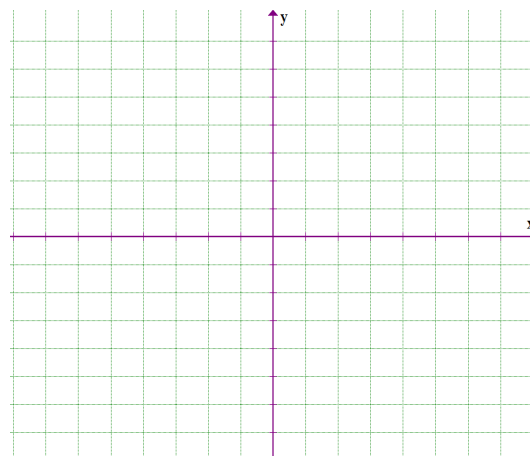
## TOPIC D: COORDINATE GEOMETRY

*Do as indicated.*

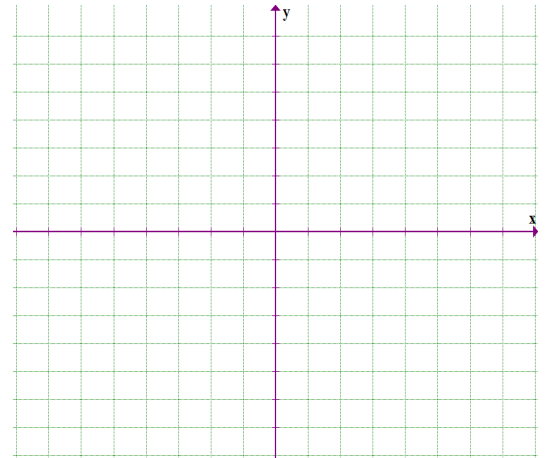
1. Draw the rectangle with vertices  $A(1,3)$ ,  $B(5,3)$ ,  $C(1,-3)$  and  $D(5,-3)$  on a coordinate plane. Find the area of the rectangle.



- 
2. Plot the points  $P(1,5)$ ,  $Q(0,6)$  and  $R(-5,1)$  on a coordinate plane. Where must the point S be located so that the quadrilateral PQRS is a square? Find the area of this square.



3. Show in two ways, that is by using distance formula and slopes, that the triangle with vertices  $A(6, -7)$ ,  $B(11, -3)$  and  $C(2, -2)$  is a right a triangle. Find the area of this triangle.



**TOPIC E: POLYNOMIALS AND POLYNOMIAL FUNCTIONS**

*Do as indicated.*

1. Factor the following polynomials.

a.  $27x^9y^6 - 64z^3$

---

b.  $a^6m^2 - 16a^3m^2 + 64m^2$

---

c.  $4cx^2 - 2dx^2 + 2cy - dy$

---

d.  $8x^5 - 32x^3y^2 + x^2y^3 - 4y^5$

---

2. Find the remainder when  $(2x^{100} - 3x + 4)$  is divided by  $(x - 1)$

**TOPIC F: RATIONAL EXPRESSIONS AND RATIONAL FUNCTIONS***Do as indicated.*

1. Simplify the following rational expressions.

a. 
$$\frac{x}{(x-1)^2} + \frac{2}{x} - \frac{x+1}{x^3-x^2}$$

---

b. 
$$\frac{9x^2-25}{2x-2} \cdot \frac{1-x^2}{6x-10}$$

---

c. 
$$\frac{\frac{15}{x^2} - \frac{2}{x} - 1}{\frac{4}{x^2} - \frac{5}{x} + 4}$$

---