

RAMAPO-INDIAN HILLS SCHOOL DISTRICT

Dear Ramapo-Indian Hills Student:

Please find attached the summer packet for your upcoming math course. The purpose of the summer packet is to provide you with an opportunity to review prerequisite skills and concepts in preparation for your next year's mathematics course. While you may find some problems in this packet to be easy, you may also find others to be more difficult; therefore, you are not necessarily expected to answer every question correctly. Rather, the expectation is for students to put forth their best effort, and work diligently through each problem.

To that end, you may wish to review notes from prior courses or on-line videos (www.KhanAcademy.com, www.glencoe.com, www.youtube.com) to refresh your memory on how to complete these problems. We recommend you circle any problems that cause you difficulty, and ask your teachers to review the respective questions when you return to school in September. Again, given that math builds on prior concepts, the purpose of this packet is to help prepare you for your upcoming math course by reviewing these prerequisite skills; therefore, the greater effort you put forth on this packet, the greater it will benefit you when you return to school.

Please bring your packet and completed work done on the packet to the first day of class in September. Teachers will plan to review concepts from the summer packets in class and will also be available to answer questions during their extra help hours after school. Teachers may assess on the material in these summer packets after reviewing with the class.

If there are any questions, please do not hesitate to contact the Math Supervisors at the numbers noted below.

Enjoy your summer!

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Precalculus CPE Summer Packet

Note: You will be assessed on this content at the beginning of the school year **WITHOUT** the use of a calculator. It is advised that you practice these concepts without a calculator to prepare for this assessment.

1. Fraction Addition and Subtraction

Find the sum or difference.

a) $\pi/3 + 2\pi$

b) $5\pi/6 - 4\pi$

c) $\pi/3 - \pi/4$

2. Graphing Angles in Standard Position

Graph each angle in standard position.

a) $5\pi/6$

b) 330°

c) $9\pi/4$

3. Evaluate Six Trigonometric Functions

Find the six trigonometric functions for each angle below.

a) $\pi/3$

b) $3\pi/4$

c) $7\pi/6$

d) $3\pi/2$

4. Radicals

Simplify each expression.

a) $\sqrt{24x^2}$

b) $\sqrt{6} * \sqrt{12}$

c) $3\sqrt{x} + 9\sqrt{x}$

5. Factoring

Factor each expression completely.

a) $x^3 + 8$

d) $2(x+1)^2 + (x+1) - 2$

b) $y^4 - 5y^2 - 36$

e) $a^3 - a^2 - 8a + 8$

c) $8u^2 + 19u + 6$

f) $25x^2 - 64y^2$

6. Dividing Polynomials

Divide the following polynomials using long division. Express the quotient as $P(x)/$

$$D(x) = Q(x) + R(x)/D(x)$$

A) **Divide** $(7x^5 - 2x^4 - 15x^3 - 21x^2 + 11x - 13) \div (x - 2)$

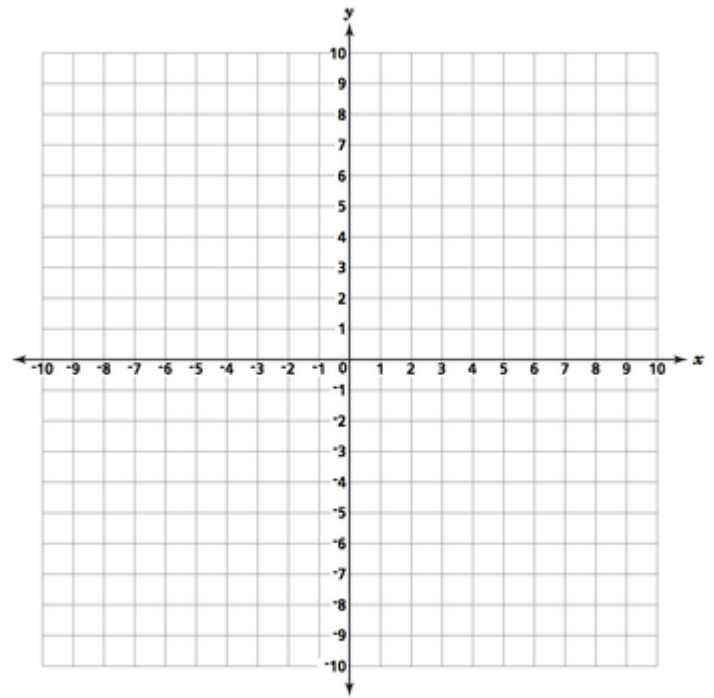
B) **Divide** $2x^5 + 4x^4 - 4x^3 - x - 3$ by $x^2 - 2$

C) **Divide** $x^5 + x^4 - 2x^3 + x + 1$ by $3x - 4$

7. Polynomials

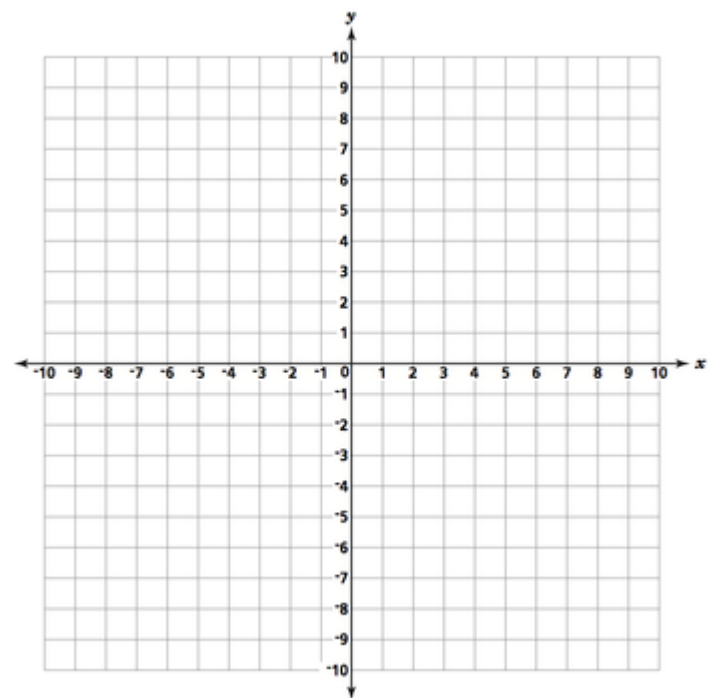
- a) Sketch the graph of the function and compare it with the graph of $y=x^2$

$$y = (x - 1)^2 + 4$$



- b) Graph the polynomial and describe the end behavior of the graph.

$$f(x) = x^2 - x - 6$$



- c) Find the polynomial function that has the given zeros.

4, 2

8. Complex Numbers

Perform the operation(s) and write the result in standard form.

a) $(2 + 13i) + (6 - 5i)$

b) $5i(13 - 8i)$

c) $(10 - 8i)(2 - 3i)$

9. Logs

Expand each logarithmic expression.

a) $\log xy$

b) $\log x^2$

c) $\log \frac{x^3 y^6}{\sqrt{z}}$

Condense each logarithmic expression.

a) $3 \log x$

b) $\log x - \log y$

c) $2 \log x + 5 \log y - \frac{1}{3} \log z$

Evaluate.

a) $\log_2 8$

b) $\log_4 4$

c) $\log_{25} 1$

Write in exponential form.

a) $\ln x = a$

b) $\log_4 16 = 2$

c) $\log 100 = 2$

Solve each equation. Check your solutions.

a) $e^x = 72$

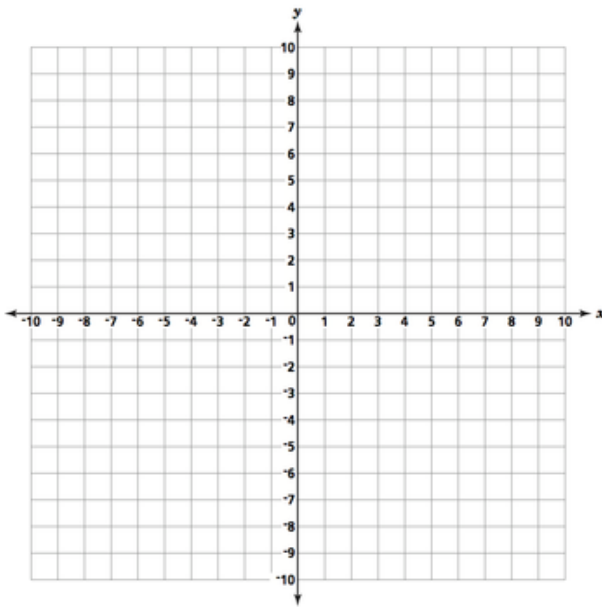
b) $3 \log_4 6x = 9$

c) $\log_3 x^2 + \log_3 9 = \log_3 10$

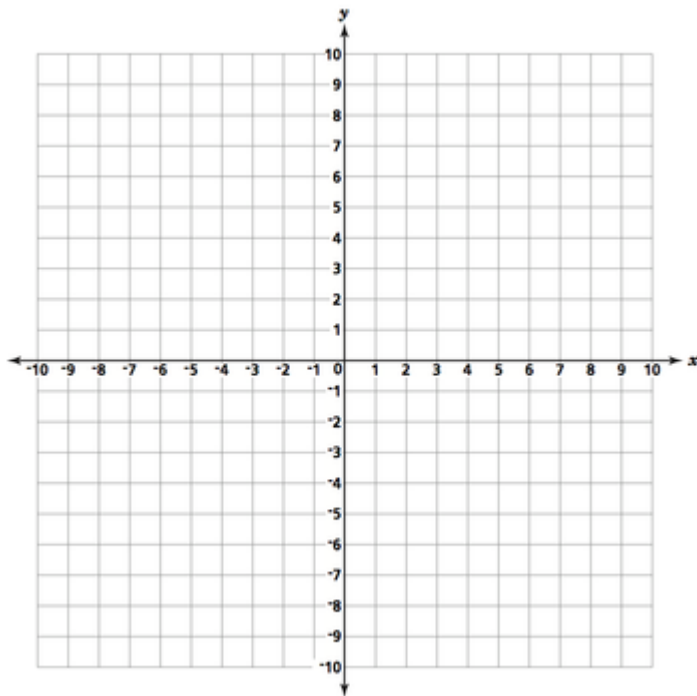
10. Graphing Rational Functions

- Find the Domain of the function
- Identify vertical asymptotes, holes, or both
- Identify horizontal asymptotes
- Draw a rough sketch of the graph

a) $f(x) = \frac{2-x}{x+3}$



b) $f(x) = \frac{2x-10}{x^2-2x-15}$



c) $f(x) = \frac{x^2-16}{x-4}$

