

PreCalculus – level 2

Summer Packet

This packet of exercises reflects skills that the Math Department considers essential for your success in PreCalculus!

In this packet you will find the following:

- Questions on material previously learned in both Algebra 1/2 and Geometry.
- Topics from Khan Academy referenced in the directions for each problem set. If you are having difficulty recalling how to do a specific type of problem, the Khan Academy videos are an excellent resource for re-teaching. Go to www.khanacademy.org, type in the phrase provided, and it will take you to a video(s) about the topic. Khan Academy also provides further practice on the topics that you can do for your own self-assessment.

Your Responsibility is to:

- Complete all problems and show all necessary work **clearly and carefully**
- Turn in the packet on **THE FIRST DAY OF SCHOOL!** It will be collected and checked for completion on the first day of school.

You will be tested on the material within the first two weeks of school.

Have a great summer!

Summer Packet

Date _____ Period _____

Simplify. Your answer should contain only positive exponents. (Khan Academy Topic: simplifying expressions with exponents)

1) $3u^{-3}v^4 \cdot 3u^{-1}v^0$

2) $3x^0 \cdot 4y^2$

3) $3a^{-2}b^{-3} \cdot 2a^3b^3$

4) $4xy^3 \cdot x^{-2} \cdot 2x^3y^4$

Find each product. (Khan Academy Topic: Multiplying Binomials)

5) $(-5r - 2)(-4r + 2)$

6) $(-2n + 1)(4n + 1)$

7) $(5v - 6)^2$

Simplify each difference. (Khan Academy Topic: Polynomial basics)

8) $(2b^4 + 8b^2 + 8b^3) - (3b^4 + 7b^2 - 5)$

9) $(2p^3 + 2 + 7p) - (p - 5p^3 + 1)$

Solve each equation by factoring. (Khan Academy Topic: Solving a quadratic by factoring)

10) $a^2 - 6a = 7$

11) $k^2 + k - 20 = 0$

Factor each completely. (Khan Academy Topic: Factoring quadratics)

12) $2n^2 - 200$

Simplify each expression. (Khan Academy Topic: "Adding and Subtracting Rational expressions"
AND "Multiplying and Dividing Rational Expressions")

$$13) \frac{2}{6} - \frac{r+1}{5r-5}$$

$$14) \frac{6k}{3} - \frac{k+5}{3k+4}$$

$$15) \frac{2}{v-3} + \frac{6v}{3v+3}$$

$$16) \frac{p^2 - p - 72}{8} \cdot \frac{8}{p^2 + 14p + 48}$$

$$17) \frac{a-1}{a^2 + 16a + 60} \div \frac{a+8}{a^2 + 16a + 60}$$

$$18) \frac{b-2}{-b^2 + 8b - 12} \div \frac{2}{7b - 42}$$

Simplify. (Khan Academy Topic: "Simplifying Radical Expressions")

19) $\frac{\sqrt{5x^3y}}{\sqrt{2x^4y^4}}$

20) $\frac{\sqrt{8x}}{\sqrt{10x}}$

21) $(7 - 6i) - (3 - 6i)$

22) $(5 + i)^2$

Solve each equation with the quadratic formula. (Khan Academy Topic: "How to Use the Quadratic Formula")

23) $3n^2 = -4n + 16$

24) $12x^2 + 8 = -12x$

Evaluate each expression. (Khan Academy Topic: "Logarithms")

25) $\log_3 27$

Condense each expression to a single logarithm. (Khan Academy Topic: "Operations with Logarithms")

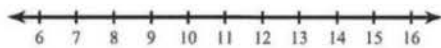
26) $3 \log_6 u + 12 \log_6 v$

Solve each equation. Remember to check for extraneous solutions.(Khan Academy Topic: "Equations with Square Roots and Cube Roots")

27) $\sqrt{2r+2} = \sqrt{3r-2}$

Solve each inequality and graph its solution.(Khan Academy Topic: "Graphing Inequalities 1 and 2")

28) $129 \geq -3(-3 - 5x)$



Solve each equation.(Khan Academy Topic: "Solving Absolute Value Equations")

29) $\left| \frac{x}{9} \right| = 3$

Perform the indicated operation.(Khan Academy Topic: "Introduction to Function Composition")

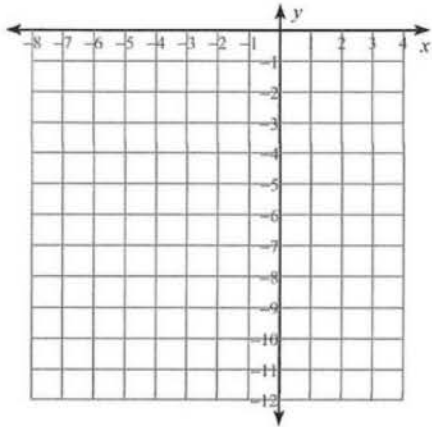
30) $f(n) = 3n - 1$
 $g(n) = -3n^2 - n$
Find $(f \circ g)(n)$

Find the inverse of each function.(Khan Academy Topic: "Inverse Functions")

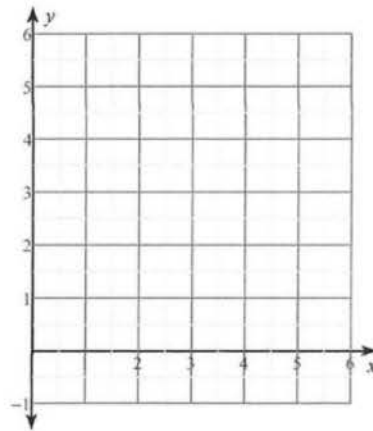
31) $g(n) = \frac{3}{5}n - \frac{9}{5}$

Sketch the graph of each function. (Khan Academy Topic: "Quadratics and shifts")

32) $y = -2x^2 - 4x - 5$



33) $y = \frac{1}{2}(x - 2)^2 + 2$



Solve each equation. Remember to check for extraneous solutions. Show your work.

34) $\frac{1}{5p^2} = \frac{1}{p^2} + \frac{1}{5p}$

35) $\frac{1}{m^2 - 2m} - \frac{1}{m - 2} = \frac{2}{m^2 - 2m}$

36) $\frac{x - 3}{2x} = \frac{x^2 - 8x + 16}{2x^2} + \frac{1}{x}$

37) $1 + \frac{1}{m - 5} = \frac{6}{m^2 - 4m - 5}$