

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

2022 Summer/Fall  
Skelton


**Gulf Breeze High School**  
**Precalculus Honors Summer Review Packet**

Attached you will find review problems from previous mathematics courses that are important for your success in Precalculus Honors. Solve each problem to the best of your ability. You should feel comfortable with the content of this material. Please **SHOW ALL WORK** that you performed to arrive at your final answer. If you do not remember how to answer some of these problems, make an effort to watch a video on youtube or [khanacademy.org](https://www.khanacademy.org) to help refresh this concept. All problems should be completed without a calculator.

This packet will be collected once your return to school in the Fall and will count as part of your first marking period grade. Also, expect a test over this material the first week we return to school.

Enjoy the journey

Mrs. Skelton

 For your success in Precalculus you will need a TI-84+ graphing calculator. This is the same calculator allowed when taking both the ACT and SAT.

**1-6 Perform the indicated operation.**

1.  $\frac{1}{4} + \frac{2}{3}$

2.  $\frac{x}{2} - \frac{2x}{5}$

3.  $\frac{3}{2x} + \frac{4}{x^2}$

4.  $\frac{2}{5} - \frac{3}{x}$

5.  $\frac{2}{7x} \cdot \frac{x^3}{8}$

6.  $\frac{2}{7x} \div \frac{x^3}{8}$

**7-12 Simplify.**

7.  $5x^2 \cdot 2x^3$

8.  $(5x^2)^3$

9.  $(3x^2y)^{-2}$

10.  $\frac{5x^{-3}}{y^{-2}}$

11.  $\frac{x^{-1}y}{xy^{-2}}$

12.  $(2^{-2})^{-3}$

**13-18 Simplify each expression.**

13.  $\sqrt{20}$

14.  $5\sqrt{40}$

15.  $2\sqrt{3} \cdot 3\sqrt{6}$

16.  $\frac{3}{\sqrt{5}}$

17.  $\frac{5}{2-\sqrt{3}}$

18.  $(1 + \sqrt{3})(1 - \sqrt{3})$

**19-24 Factor each polynomial completely.**

19.  $x^2 - 7x + 3x - 21$

20.  $6x^2 - 7x - 3$

21.  $x^4 - 81$

22.  $y^4 + 6y^2 + 9$

23.  $2x^4 - 6x^2 + 8$

24.  $27y^3 - 125$

**25-28 Solve each.**

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

26.  $(2x - 1)(x - 1) = (x - 5)(2x - 5)$

27.  $(x - 5)^2 = 9$

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

**29-30 Solve each equation for y.**

29.  $7y + 6x = 10$

30.  $\frac{1}{4}y - 7x = \frac{15}{2}$

**31-32 Find the solution for each system of equations. Write in (x, y) form.**

31.  $-2x - 5y = 7$   
 $7x + y = -8$

32.  $4x + 9y = 2$   
 $2x + 6y = 1$

**33-34 Solve by completing the square.**

33.  $x^2 - 4x + 6 = 0$

34.  $4x^2 + 4x = 3$

**35-39 Find the equation in slope-intercept form that describes each line.**

35. The line through (3, -2) with slope  $\frac{4}{5}$ .

36. The line through the points (-1, -4) and (3, 2).

37. A horizontal line through (-2, 4).

38. The line through (2, -3) and parallel to  $2x + 5y = 3$ .

39. The line through (2, -3) and perpendicular to  $2x + 5y = 3$ .

**40-46 Given  $f(x) = x^2 - 4$  and  $g(x) = \sqrt{2x + 4}$ , determine each of the following.**

40.  $f(3)$

41.  $g(2)$

42.  $f(g(4))$

43.  $f(g(x))$

44. Domain of  $f(g(x))$

45.  $f^{-1}(x)$

46. Is the inverse of  $f(x)$  a function?

**47-52 Solve for x.**

47.  $27^{x+1} = 9^{2x-4}$

48.  $\frac{1}{4} = 8^{x+3}$

49.  $\log_3 9 = x$

50.  $\log_x 8 = \frac{3}{2}$

51.  $\log_a x = 3$

52.  $\ln e^x = 4$

53. Match the equation to its description.

\_\_\_\_\_ a.  $f(x) = |4x + 5|$

D. Linear Function

\_\_\_\_\_ b.  $f(x) = \sqrt[3]{4x + 5}$

O. Quadratic Function

\_\_\_\_\_ c.  $f(x) = \frac{1}{4x+5}$

L. Absolute Value Function

\_\_\_\_\_ d.  $f(x) = (4x + 5)^4 - 3(3x + 5)^3$

P. Cubic Function

\_\_\_\_\_ e.  $f(x) = (4x + 5)^3$

H. Cube Root Function

\_\_\_\_\_ f.  $f(x) = (4x + 5)$

I. Square Root Function

\_\_\_\_\_ g.  $f(x) = (4x + 5)^2$

N. Rational Function

\_\_\_\_\_ h.  $f(x) = \sqrt{4x + 5}$

S. Polynomial Function

54. Simplify each:

a.  $\frac{x^2+7x+12}{x^2-16}$

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

c.  $\frac{4}{x^2-4} - \frac{2}{x^2+x-6}$

d.  $\frac{\frac{1}{x} - \frac{1}{y}}{\frac{3}{xy} - \frac{3}{x^2}}$

55. Given  $f(x) = \frac{x^2+7x+12}{x^2-16}$ , graph then find the following:

a. x-intercept(s) \_\_\_\_\_

e. horizontal asymptote \_\_\_\_\_

b. y-intercept \_\_\_\_\_

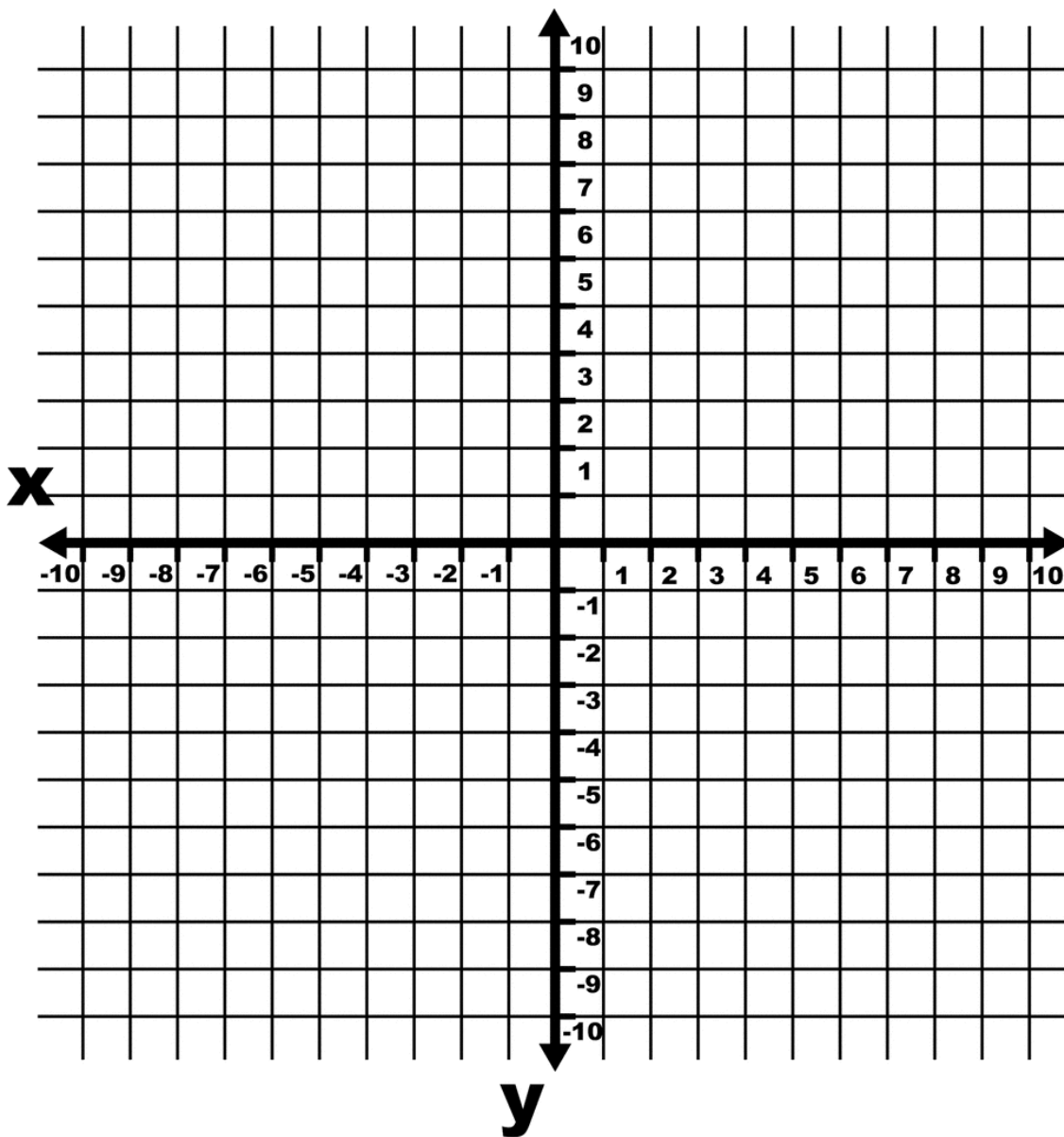
f. oblique asymptote \_\_\_\_\_

c. equation(s) of vertical asymptote \_\_\_\_\_

g. location of hole(s) \_\_\_\_\_

d. domain \_\_\_\_\_

h. end behavior \_\_\_\_\_



56. Match each conic equation with its correct description:

\_\_\_\_\_ a.  $x^2 + y^2 = 100$

C. Circle

\_\_\_\_\_ b.  $4x^2 + y^2 = 100$

O. Hyperbola

\_\_\_\_\_ c.  $x^2 - 4y^2 = 100$

N. Parabola

\_\_\_\_\_ d.  $x^2 + 4y = 100$

E. Ellipse

\_\_\_\_\_ e.  $\frac{x^2}{16} + \frac{y^2}{4} = 1$

\_\_\_\_\_ f.  $\frac{x^2}{16} - \frac{y^2}{4} = 1$

\_\_\_\_\_ g.  $\frac{x}{4} - \frac{y^2}{16} = 1$

\_\_\_\_\_ h.  $\frac{y^2}{1} + \frac{x^2}{1} = 1$

57. Convert the following angle measures from degrees to radians.

a.  $45^\circ$

b.  $120^\circ$

c.  $310^\circ$

58. Convert each radian measure to degrees.

a.  $\frac{\pi}{3}$

b.  $\frac{11\pi}{6}$

c.  $\frac{5\pi}{4}$

59. Evaluate each. You may want to fill in the Unit Circle first (next question) to help you streamline these questions. Leave all answers exact!

a.  $\cos 0$

b.  $\sin 180^\circ$

c.  $\tan \frac{\pi}{4}$

d.  $\cos 150^\circ$

e.  $\sin \frac{11\pi}{6}$

f.  $\cos \frac{\pi}{3} + \tan \frac{2\pi}{3} + \sin \frac{5\pi}{6}$