

**Powell High School**  
**Honors Precalculus**  
**Summer Assignment**

Name \_\_\_\_\_

Complete all problems below. Use pencil to complete all math assignments. Show all steps. This assignment will be due on the first day of class, and will be entered as a homework assignment.

Should you need assistance on any problem, please go to the following link:

[http://www.mathtv.com/videos\\_by\\_playlist?c=1&playlist\\_id=28620](http://www.mathtv.com/videos_by_playlist?c=1&playlist_id=28620)

1. Find the domain of each function below. Explain each answer using complete sentences.

a)  $f(x) = \frac{x-4}{x-2}$

b)  $g(x) = \frac{x^2+5}{x+1}$

c)  $h(x) = \frac{x}{x^2-9}$

2. Factor  $y^3 + 27$

3. Factor  $2x^4 + 16x$

4. Simplify  $\frac{\frac{3}{4}}{\frac{5}{8}}$

5. Simplify  $\frac{\frac{x-2}{x^2-9}}{x+3}$

6. Simplify  $\frac{\frac{2x^3}{y^2}}{\frac{4x}{y^5}}$

7. Simplify  $\frac{x+\frac{1}{y}}{y+\frac{1}{x}}$

8. Divide, using synthetic division.

$$\frac{3x^3 - 4x + 5}{x + 4}$$

9. Simplify (to simplest radical form)  $\sqrt{75}$

10. Simplify (to simplest radical form)  $\sqrt{\frac{49}{81}}$

11. Solve the system of equations.

$$\begin{aligned}x + y &= 2 \\ y &= 2x - 1\end{aligned}$$

12. Solve the system of equations.

$$\begin{aligned}x - 3y &= -1 \\ 2x - 3y &= 4\end{aligned}$$

13. Factor  $x^3 - 8$

14. Factor  $y^3 + 25y$

15. Let  $f(x) = 2x - 1$  and  $g(x) = x^2 - 4$

a) Find  $x$  if  $f(x) = 0$

b) Find  $x$  if  $g(x) = 0$

c) Find  $x$  if  $f(x) = g(x)$

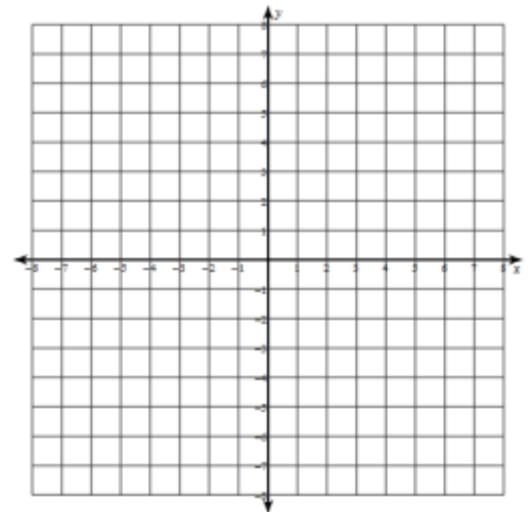
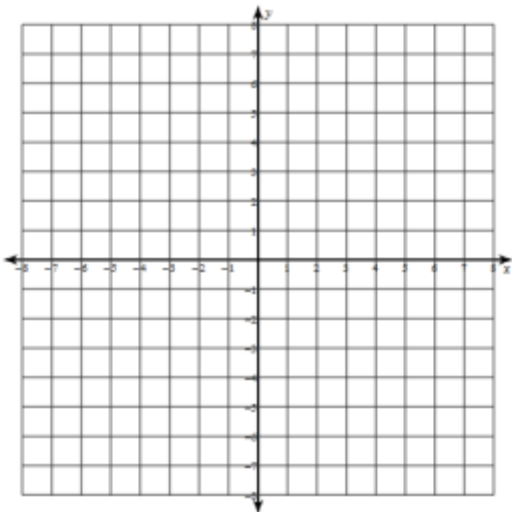
d) Find  $(f + g)(x)$

e) Find  $(fg)(x)$

f) Find  $\left(\frac{f}{g}\right)(x)$

16. Find the inverse of  $f(x) = 2x - 3$

17. Graph  $y = x^2 - 2$ . Then find its inverse, and graph it.



18. Factor  $5x^3 - 15x^2$

19. Factor  $x^3 + 2x^2 + 9x + 18$

20. Factor  $3x^3 - 3x^2 - 18x$

21. Factor  $6a^2 + 7a + 2$

22. Factor  $6a^2 - 11a + 4$

23. Factor  $4x^2 - x - 3$

24. Factor  $16x^2 - 25$

25. Factor  $36a^2 - 1$