

Simplify each expression:

1- $\frac{24pn}{18p^2}$

2- $\frac{x^2-5x-14}{x^2+7x+10}$

3- $\frac{2x^2-6x}{x^3-9x}$

4- $\frac{x^2+2x-15}{3x^2-4x-15}$

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

6- $\frac{3x^2-3x-18}{3x^2-27}$

Simplify each product or quotient:

7- $\frac{y^2-1}{2y-1} \cdot \frac{2y^2+y-1}{y^2+2y+1}$

8- $\frac{x^2+5x+4}{x^2+2x+1} \cdot \frac{2x+2}{x+4}$

9- $\frac{\frac{m^2}{5f^2}}{\frac{m}{f^3}}$

10. $\frac{m+2f}{6} \div \frac{m^2-4f^2}{10}$

11. $\frac{x^3}{x^2-64} \div \frac{x^2}{x+8}$

12. $\frac{\frac{3m^2-12}{4m^2+8m}}{\frac{6m-12}{8m^2+16m}}$

Simplify each sum or difference:

13. $\frac{1}{5} - \frac{3}{2w} + \frac{3}{10w}$

14. $\frac{2}{x} - \frac{x-2}{3x} + \frac{x}{3}$

15. $\frac{30}{m^2-25} + \frac{3}{m-5}$

16. $\frac{2}{x-2} - \frac{3x}{x^2+2x-8}$

17. $\frac{3r}{r+4} - \frac{r+3}{2r+8}$

18. $\frac{3r}{r^2-7r+10} - \frac{1}{r-2} + \frac{6}{r-2}$

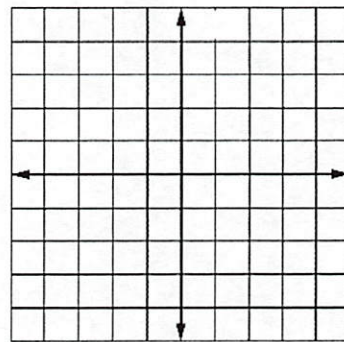
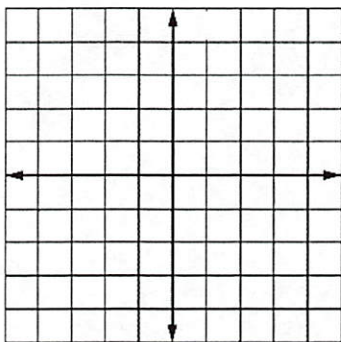
Graph each function. State the domain and range and the asymptotes.

19. $f(x) = \frac{2}{x}$

20. $f(x) = \frac{-1}{x-3}$

V. A. _____ H. A. _____

V. A. _____ H. A. _____

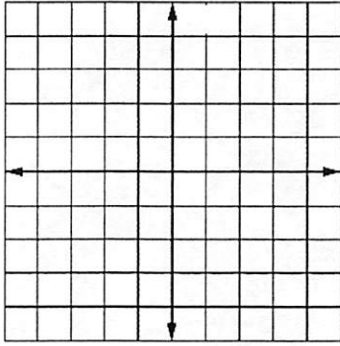


Domain. _____ Range. _____

Domain. _____ Range. _____

21. $f(x) = \frac{3}{x} - 2$

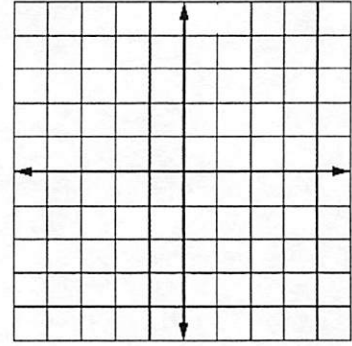
V. A. _____ H. A. _____



Domain. _____ Range. _____

22. $f(x) = \frac{4}{x+2} + 3$

V. A. _____ H. A. _____

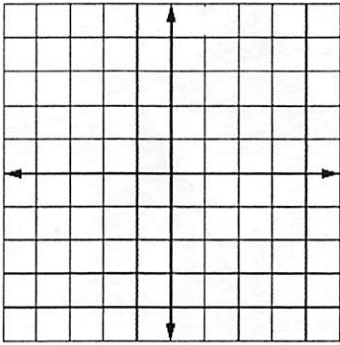


Domain. _____ Range. _____

Graph each function: Identify any holes and asymptotes.

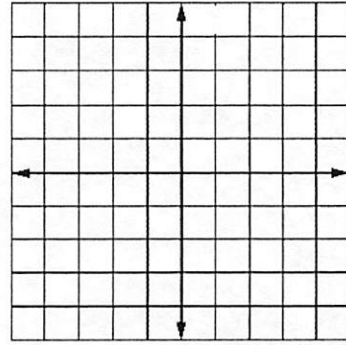
23. $f(x) = \frac{x^2+4x+4}{x+2}$

V. A. _____ H. A. _____ Holes: _____



24. $f(x) = \frac{x+3}{x^2+5x+6}$

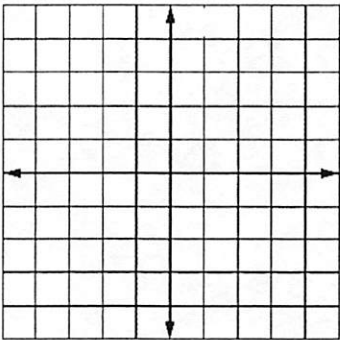
V. A. _____ H. A. _____ Holes: _____



Graph each function: Identify any holes and asymptotes.

25. $f(x) = \frac{2x^3-4x^2+6x}{x^2-2x+3}$

V. A. _____ H. A. _____ Holes: _____



For each function: Identify any holes, asymptotes and intercepts:

26. $f(x) = \frac{x-2}{x^2}$

27. $f(x) = \frac{x^2-9}{x+5}$

V.A.: _____

V.A.: _____

H.A.: _____

H.A.: _____

x-int: _____

x-int: _____

y-int: _____

y-int: _____

28. $f(x) = \frac{x^2-x-30}{2x^2+5x+3}$

29. $f(x) = \frac{x^2+2x}{-4x-12}$

V.A.: _____

V.A.: _____

H.A.: _____

H.A.: _____

x-int: _____

x-int: _____

y-int: _____

y-int: _____

Solve each equation (check for extraneous solutions):

30. $y + 4 = \frac{5}{y}$

31. $n - \frac{n}{n-4} = \frac{12-4n}{n-4}$

32. $\frac{3}{k-3} + \frac{4}{k-4} = \frac{25}{k^2-7k+12}$

33. $\frac{12}{2x+4} = \frac{x-7}{x+2} + \frac{1}{4}$

34. $\frac{x+1}{x-3} = 4 - \frac{12}{x^2-2x-3}$

35. $\frac{x+5}{x^2+x} = \frac{1}{x^2+x} - \frac{x-6}{x+1}$