Algebra 1B—Chapter 11 Test REVIEW: Rational Functions

SECTION 1

Multiply and Divide Rational Expressions

Simplify.

1. $\frac{15x+20}{3x+4} * \frac{x+4}{5}$

2. $\frac{x+8}{5x+1} \div \frac{60x^2}{5x+1}$

3. $\frac{2x^2-11x+12}{7x^2-76x+60} * \frac{49x-42}{2x-3}$

4. $\frac{7x-8}{14x^2-72x+64} \div \frac{30}{10x-40}$

SECTION 2

Solve each Rational Equation

5. $\frac{1}{x+4} = \frac{1}{x^2+4x}$

6. $\frac{2}{4x-3} + 1 = 6$

7. $\frac{x^2+7x+12}{4} = \frac{x+3}{0.8}$

SECTION 3

Use Long Division to Simplify Each Expression

8. $\frac{x^4+3x^3-x^2-x+6}{x+3}$

9. $\frac{x^3-4x^2+9}{x-3}$

10. $\frac{2x^4+8x^3-5x^2-4x+2}{x^2+4x-2}$

11. $\frac{3x^4+9x^3-5x^2-6x+2}{3x^2-2}$

SECTION 4

Design Rational Functions.

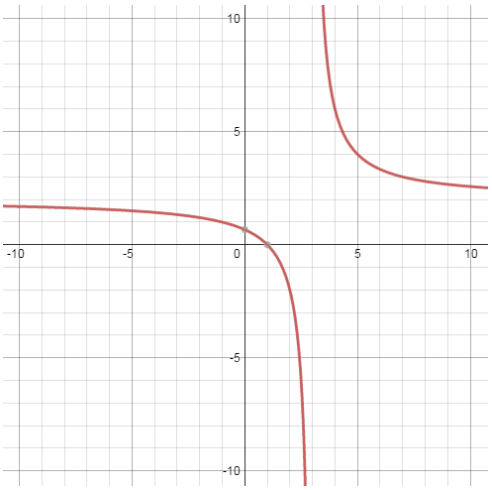
Given the following functions, state the roots, any asymptotes—both vertical and horizontal—and any domain restrictions.

12. f(x) so that the function…
    a. has a root at x=3/2
    b. has a vertical asymptote at x= 4/5
    c. has a horizontal asymptote at y = 2

13. g(x) so that the function…
    a. has a root at x= 8
    b. has a vertical asymptote at x= -5

14. h(x) so that the function…
    a. has a root at x= 4
    b. has a vertical asymptote at x= 1
    c. has a horizontal asymptote at y = -2

15.



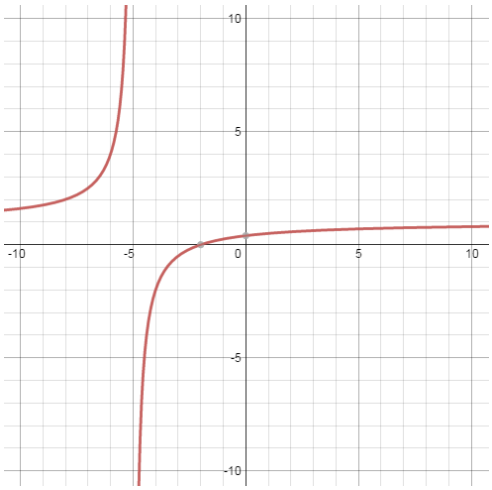
Roots:

Vertical Asymptote:

Horizontal Asymptote:

Equation:

16.



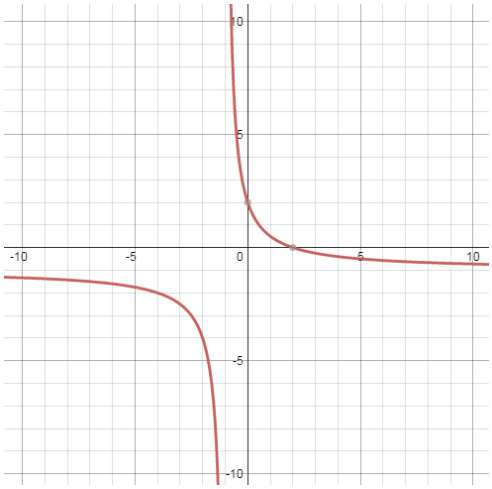
Roots:

Vertical Asymptote:

Horizontal Asymptote:

Equation:

17.



Roots:

Vertical Asymptote:

Horizontal Asymptote:

Equation:

SECTION 5

18. f(1) f(2) f(3) f(4) f(5) f(6) …
3, 6, 12, 24, 48, 96, …

a. Is the sequence Arithmetic or Geometric? How do you know?

b. What are the next three terms in the sequence?
f(7) f(8) f(9)

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c. Write a recursive definition of the function.

d. Write an explicit definition of the function

19. g(1) g(2) g(3) g(4) g(5) g(6) …
3, 10, 17, 24, 31, 38, …

e. Is the sequence Arithmetic or Geometric? How do you know?

f. What are the next three terms in the sequence?
g(7) g(8) g(9)

___ ___ ___

g. Write a recursive definition of the function.

h. Write an explicit definition of the function