RATIONAL FUNCTIONS TEST REVIEW Name: _____

SECTION 1: OPERATIONS OF RATIONAL EXPRESSIONS

Complete the operation or simplify.

1. $\dfrac{4x+12}{x^2-2x-15}$	2. $\dfrac{15x^3y^5}{2xy} \bullet \dfrac{6xy^3}{9x^4y}$
3. $\dfrac{8x^3-125}{x^2-25} \bullet \dfrac{x+5}{2x-5}$	4. $\left(\dfrac{x^2+6x}{x^2+8x+12}\right)\left(\dfrac{x^2+2x-8}{x^3-8}\right)$

5. $$\frac{\frac{x^2-9x-22}{x^2+5x-24}}{\frac{x+2}{x-3}}$$

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

7. $$\frac{5x}{x+2} + \frac{x+3}{x-2}$$

8. $$\frac{5x}{3y} - \frac{2}{15}$$

9. $\frac{2x}{x+3} + \frac{5}{x^2+3x}$	10. $\frac{x}{x^2-x-12} - \frac{5}{12x-48}$

Factor each expression completely.

11. $64x^2 - 121$	12. $x^3 - 125$
13. $6x^2 - 7x - 5$	14. $x^2 - 15x + 50$

15. $3x^3 - 24$	16. $x^2 - 13x - 30$
17. $27x^3 + 64$	18. $x^2 - 1$
19. $x^2 - 64x$	20. $20x^2 + 26x - 6$
21. $24x^4 - 8x^3 + 4x$	22. $4x^2 + 49$
23. $3x^2 + 24x + 48$	24. $25x^2 - 60x + 36$

SECTION 2: GRAPHING RATIONAL FUNCTIONS

1. How do you find a vertical asymptote of a rational function?

2. How do you find a horizontal asymptote when graphing if the degree is larger on the denominator?

3. How do you find a horizontal asymptote when graphing if the degree of the numerator is the same as the degree of the denominator?

4. How do you find a removable discontinuity of a rational function?

5. How do you find the domain and range of a rational function?

6. How do you find the degree of a polynomial in standard form?

7. How do you find the degree of a polynomial in factored form?

Circle the asymptotes of the following function. Circle all that apply.

8. $y = \frac{3}{x-1} + 4$

x = 1 x = –1 x = 4 y = 3 y = 1 y = 4

9. $y = \frac{10}{x^2 - 25}$

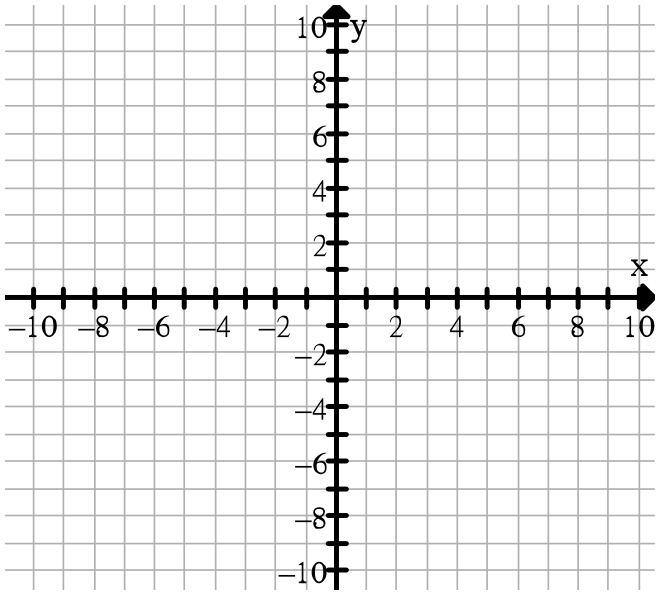
x = 5 x = 0 x = – 5 y = 0 y = 1 y = 5

10. Identify the vertical asymptote, horizontal asymptote, domain and range of each equation.

	Vertical Asymptote	Horizontal Asymptote	Domain	Range
a. $y = \frac{4}{x}$				
b. $y = \frac{1}{x+2} - 3$				
c. $y = \frac{3x-6}{x+2}$				
d. $f(x) = \frac{6x-1}{3x+6}$				

Identify the vertical asymptote, horizontal asymptote, domain and range of the graph.

11.



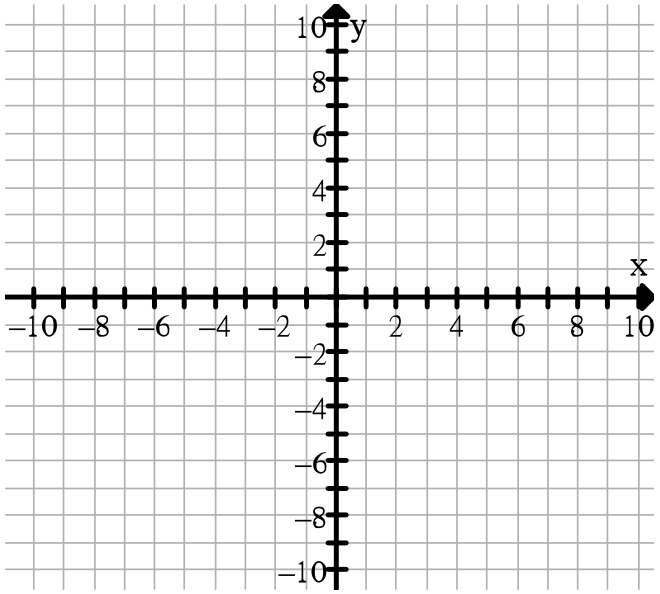
Vertical Asymptote: _____

Horiztonal Asymptote: _____

Domain: _____

Range: _____

12.



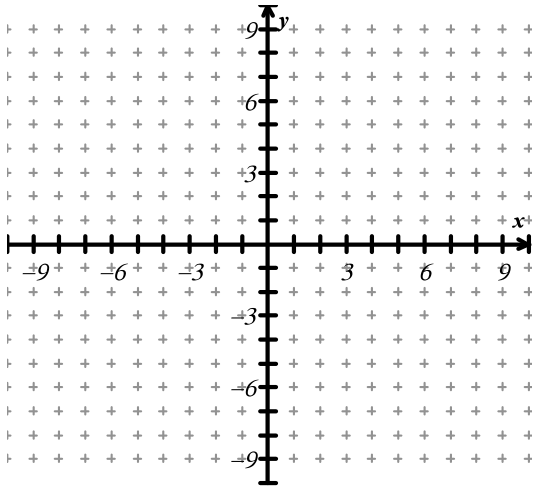
Vertical Asymptote: _____

Horiztonal Asymptote: _____

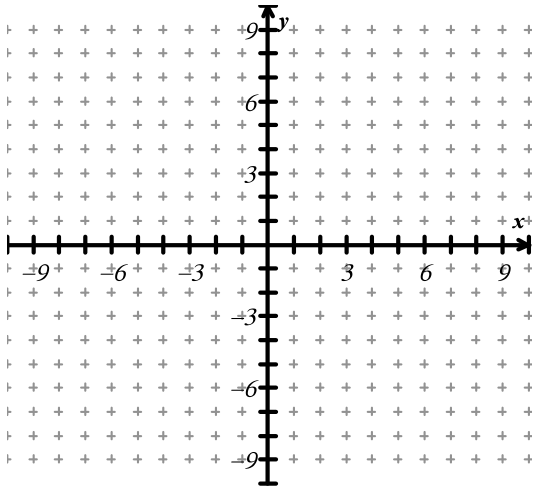
Domain: _____

Range: _____

13. $y = \dfrac{-6}{x-2} + 1$

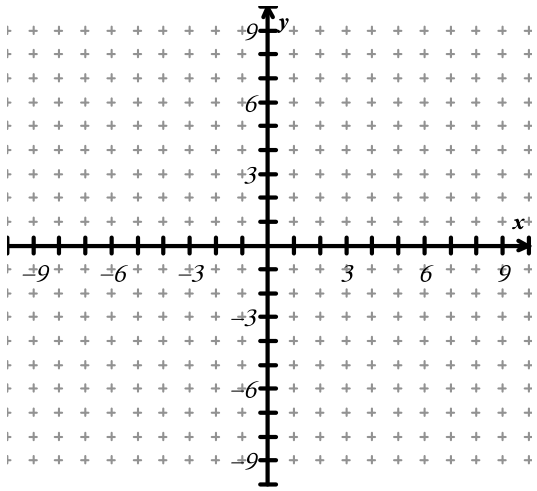
VA:	Domain:	Table	Graph
HA:	Range:		

14. $f(x) = \dfrac{2x}{x+5}$

VA:	Domain:	Table	Graph
HA:	Range:		

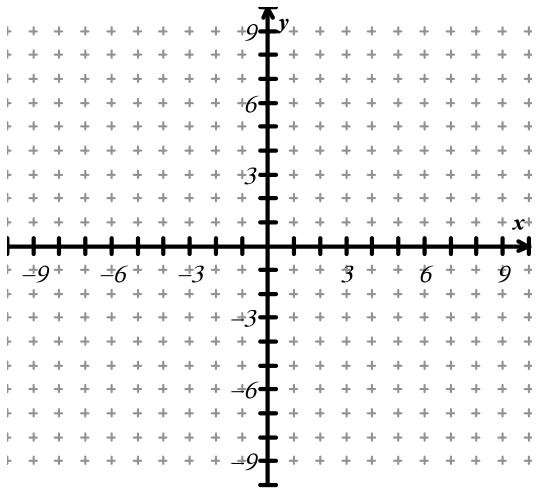
15. $f(x)=\dfrac{3x^2-3}{x^2-9}$

VA:	Domain:	Table	Graph
HA:	Range:		



16. $f(x)=\dfrac{x^2-9}{x^2+8x+15}$

VA:	Domain:	Table	Graph
HA:	Range:		



VARIATION

VARIATION:

1. Direct variation formula: _____

2. Inverse variation formula: _____

3. Joint variation formula: _____

Determine if the equation or situation represents direct, inverse, or joint variation, or neither.

4. $d = kst$

5. $m = \frac{k}{r}$

6. $s = kpr$

7. $\frac{a}{b} = 5$

8. $y = \frac{x}{10}$

9. $y = s - 7$

Translate each situation into an equation. Do Not Solve!

10. An equation shows m is directly proportional to n and inversely proportional to s cubed. When m = 5, then n = 160 and s = 2. What is the constant of proportionality? Write your answer as a fraction.

11. The weight, *w*, that a column of a bridge can support varies directly as the fourth power of its diameter, *d*, and inversely as the square of its length, *l*.

12. The number, *n*, of grapefruit that can fit into a box is inversely proportional to the cube of the diameter, *d*, of each grapefruit.

13. An equation shows m is directly proportional to n and inversely proportional to s cubed. When m = –4, then n = 160 and s = 2. What is the constant of proportionality?

14. The variable z varies jointly with x and y. Write an equation relating x, y, and z when x = -4, y = 3, and z = 2.

15. The amount of money earned at your job (m) varies directly with the number of hours (h) you work. The first day of work you earned $57 after working 6 hours. You are trying to save money to go to buy a new car to take to college next year. How many hours will you need to work in order to save $ 4750?

16. The force needed to keep a car from skidding on a curve varies jointly as the weight of the car and the square of the speed and inversely as the radius of the curve. Suppose a 3,960 lb. force is required to keep a 2,200 lb. car traveling at 30 mph from skidding on a curve of radius 500 ft. How much force is required to keep a 3,000 lb. car traveling at 45 mph from skidding on a curve of radius 400 ft.?