Alg 2A Chapter 9 Review Spring 2017

Only state restrictions on variables when indicated.

1. State if each table represents Direct Variation, Inverse Variation, or Neither. For the tables that show a variation do the following:

i) State which kind of variation

ii) State the variation constant.

iii) Write the variation equation with the value of the constant.

iv) Find the value of x when $y = 100$

a)

X	Y
−4	32.8
8	65.6
15	−124
40	−320

b)

X	Y
−20	−6.2
−8	−15.5
5	24.8
16	7.75

c)

X	Y
12	54
40	180
56	252
70	315

For each statement in 2 and 3 write the variation equation it represents

2. H varies directly with the product of M and N and inversely with the square of P

3. E varies jointly with B and the cube of G and inversely with the product of J and the square of W

4. Do parts a to c. A varies directly with D and inversely with the square of C. $A = 15$ when $D = 12$ and $C = 4$.

a) Find the variation constant.

b) Find the value of A when $D = 12$ and $C = 7$

c) Find the value of D when $A = 75$ and $C = 3$

5. Simplify. State any restrictions on the variable. $\dfrac{6x^4 + 6x^3 - 36x^2}{8x^3 - 32x}$

For 6 to 13 don't state restrictions on the variables.

6. Simplify this product.

$$\frac{2x^2 + 6x}{x^2 - 1} \cdot \frac{x^2 - 3x - 4}{x^4 - x^3 - 12x^2}$$

7. Simplify this quotient.

$$\frac{4x^2 - 36x + 32}{2x^2 - 13x - 7} \div \frac{x^2 + 4x - 5}{x^2 - 2x - 35}$$

Find each sum or difference. Simplify your answer.

8. $\dfrac{5x}{x^2 - 1} - \dfrac{3x}{x^2 + 3x + 2}$

9. $\dfrac{1}{x^2 + 8x + 16} + \dfrac{2}{x^2 + 4x}$

Simplify each.

10. $\dfrac{\frac{6}{x^3} + 1}{\frac{4}{y^2}}$

11. $\dfrac{\frac{3}{x-1} + 7}{4 - \frac{1}{x-1}}$

12. $\dfrac{\frac{7}{x^4} + \frac{3}{y}}{\frac{2}{y^2} - \frac{1}{x^2}}$

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

For 14 to 17 solve each equation. Check for extraneous solutions.

14. $\dfrac{5}{x-6} - \dfrac{3}{x+2} = \dfrac{1}{x^2 - 4x - 12}$

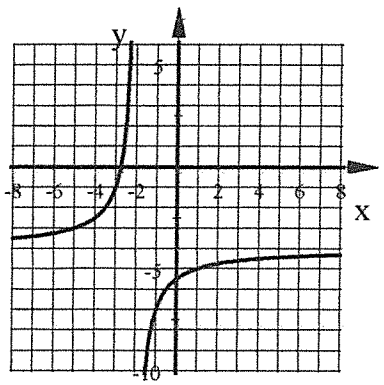
15. $\dfrac{11}{3x} + \dfrac{4}{x^2} = \dfrac{1}{3}$

16. $\frac{x}{x+2} = \frac{x+10}{x^2-4}$

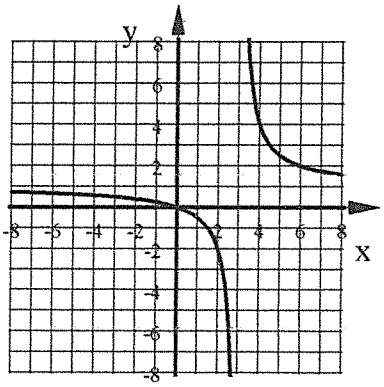
17. $\frac{3x}{x-4} + \frac{20}{x^2-3x-4} = \frac{4x}{x+1}$

18. Each graph is a transformation of the function $y = \frac{3}{x}$. Write the equation of each.

a)



b)



19. Sketch each reciprocal function. Show the asymptotes as dashed lines and state their equations.

a) $y = \frac{-50}{x-1} - 5$ b) $y = \frac{0.25}{x+4} + 3$

20. State the holes and vertical asymptotes of this rational function, if any. $y = \frac{3x(2x-7)(x+4)(x-9)}{12x(x+4)(x-5)(x+7)}$

21. For each rational function, state the equation for the HA, if any.

a) $y = \frac{9x^2+8x-3}{2x+15}$ b) $y = \frac{8x^3+3x-10}{3x^3+4x}$ c) $y = \frac{x^2+5x+6}{2x^3-3}$

22. For each rational function, state the x and y intercepts, if any.

a) $y = \frac{x^3+3x^2-10x}{x^2-25}$ b) $y = \frac{x^2-12x+20}{x^2+9x}$ c) $y = \frac{x^2+8}{x^2-7x-8}$

23. Graph this rational function. Show all intercepts and asymptotes and the proper behavior around VA and at HA.

$y = \frac{(2x+1)(x-3)}{(x-5)(x+2)} = \frac{2x^2-5x-3}{x^2-3x-10}$

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1. a) Neither

   b) Inverse variation, $k = 124$, $xy = 124$ *or* $y = \frac{124}{x}$, $x = 1.24$ when $y = 100$

   c) Direct variation, $k = 4.5$, $\frac{y}{x} = 4.5$ *or* $y = 4.5x$, $x = 22.\overline{2}$ when $y = 100$

2. $H = \frac{kMN}{P^2}$ 3. $E = \frac{kBG^3}{JW^2}$

4. a) $k = 20$ b) $A = \frac{240}{49} \approx 4.90$ c) $D = 33.75$

5. $\frac{3x(x+3)}{4(x+2)}$ $x \neq 0, \pm 2$ 6. $\frac{2}{x(x-1)}$

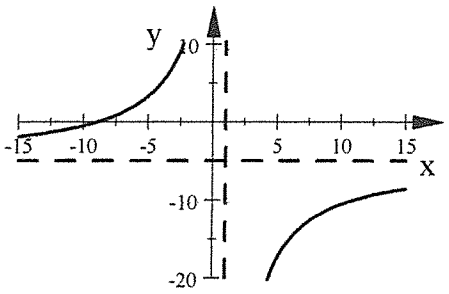
7. $\frac{4(x-8)}{2x+1}$ 8. $\frac{2x^2+13x}{(x+1)(x-1)(x+2)}$ 9. $\frac{3x+8}{x(x+4)^2}$

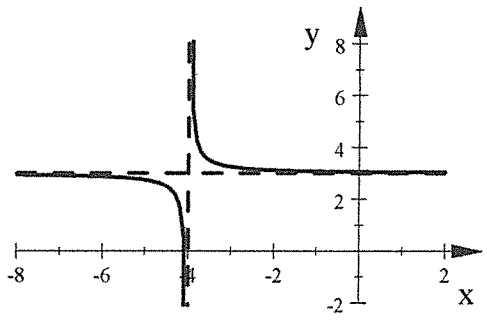
10. $\frac{6y^2+x^3y^2}{4x^3}$ 11. $\frac{7x-4}{4x-5}$ 12. $\frac{7y^2+3x^4y}{2x^4-x^2y^2}$ 13. $\frac{4x+8}{3x+10}$

14. $x = -13.5$ 15. $x = -1, 12$ 16. $x = 5$ 17. $x = 20$

18. a) $\frac{-3}{x+2} - 4$ b) $\frac{3}{x-3} + 1$

19. a) HA: $y = -5$ VA: $x = 1$ b) HA: $y = 3$ VA: $x = -4$





20. Holes: $x = -4, 0$ VA: $x = -7, 5$ 21. a) HA: NONE b) HA: $y = \frac{8}{3}$ c) HA: $y = 0$

22. a) x-int $= 0, 2$ y-int= 0 b) x-int= $2, 10$ No y-int c) No x-int y-int= -1

23. $x - int = -\frac{1}{2}, 3$ $y - int = \frac{3}{10}$ $HA : y = 2$ $VA : x = 5, -2$