

Name Key

Date _____

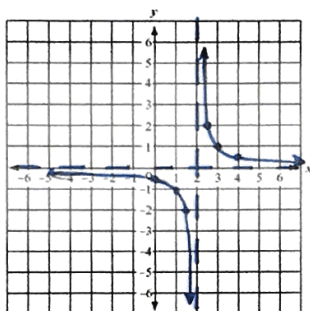
Period _____

#1-3: Describe the transformation(s) of $y = \frac{a}{x-h} + k$ to the parent function $y = \frac{1}{x}$ used to create each function, graph the function (including the asymptotes), and fill in all the blanks.

1. $y = \frac{1}{x-2}$

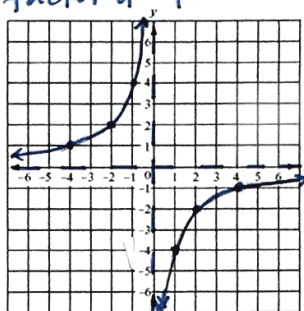
Transformations:

shift right 2 units

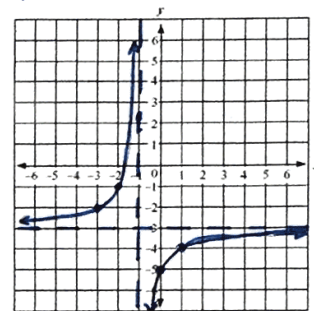
Vert. asymptote: $x=2$ Horiz. asymptote: $y=0$ Domain: AR#s, $x \neq 2$ Range: AR#s, $y \neq 0$

2. $y = \frac{-4}{x}$

Transformations:

Reflect across x-axis,
vertical stretch by a
factor of 4Vert. asymptote: $x=0$ Horiz. asymptote: $y=0$ Domain: AR#s, $x \neq 0$ Range: AR#s, $y \neq 0$

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

Transformations: Reflect across
x-axis, vertical stretch by
a factor of 2, shift left
1 unit, down 3 unitsVert. asymptote: $x=-1$ Horiz. asymptote: $y=-3$ Domain: AR#s, $x \neq -1$ Range: AR#s, $y \neq -3$

#4-5: Rewrite each function in the form $y = \frac{a}{x-h} + k$ and identify the horizontal and vertical asymptotes.

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

$$y = \frac{6}{x-1} + 2$$

Vertical asymptote: $x=1$ Horizontal asymptote: $y=2$

5. $y = \frac{x-1}{x+2}$

$$y = \frac{-3}{x+2} + 1$$

Vertical asymptote: $x=-2$ Horizontal asymptote: $y=1$

#6-7: Simplify each expression and identify any excluded values.

6. $\frac{x^2 + 2x - 8}{x^2 - 9x + 14}$

$$\frac{x+4}{x-7}; \quad x \neq 2$$

7. $\frac{x^3 - 125}{2x^2 - 11x + 5}$

$$\frac{x^2 + 5x + 25}{2x - 1}; \quad x \neq 5$$

#8-9: Find the product.

8. $\frac{40x^4}{y^3} \cdot \frac{xy}{15x^2}$

$$\frac{8x^3}{3y^2}; x \neq 0$$

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

$$\frac{x^2}{x-2}; x \neq -3, -1, 1$$

#10-11: Find the quotient.

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

$$(x-3)(x-2); x \neq -3, -2, 2$$

11. $\frac{x^2-13x+40}{x^2-2x-15} \div (x^2-5x-24)$

$$\frac{1}{(x+3)^2}; x \neq 5, 8$$

#12-13: Find the sum.

12. $\frac{p-2}{2p} + \frac{p+3}{3p}$

$$\frac{5}{6}; p \neq 0$$

13. $\frac{5x}{x+8} + \frac{4x-9}{x^2+5x-24}$

$$\frac{5x^2-11x-9}{(x+8)(x-3)}$$

#14-15: Find the difference.

14. $\frac{5x}{x-3} - \frac{15}{x-3}$

$$5, x \neq 3$$

15. $\frac{3}{x^2-1} - \frac{1}{x-1}$

$$\frac{2-x}{(x-1)(x+1)}$$

#16-18: Solve each equation. Check for extraneous solutions.

16. $\frac{x^2}{9} = \frac{x+2}{2}$

$$x = -\frac{3}{2}, 6$$

17. $\frac{x+1}{x+6} + \frac{1}{x} = \frac{2x+1}{x+6}$

$$x = -2, 3$$

18. $\frac{x}{x-2} - \frac{1}{x+3} = \frac{10}{x^2+x-6}$

$$x = -4$$

Remember to review Quizzes #1 and #2 and make sure you know how to do ALL of the problems!
Answer keys to quizzes are posted in the SchoolLoop course locker so you can check your answers.