Name _____ Date _____ Class _____

CHAPTER 8

Performance Assessment Teacher Support

Rational and Radical Functions

Purpose:

To assess student understanding of analyzing and graphing rational functions.

Time:

20–30 minutes

Grouping:

Individuals or partners

Preparation Hints:

Review what creates asymptotes and holes in rational functions.

Introduce the Task:

Students are presented with a description of a rational function. By working backward, students will be able to re-create the function that fits the description.

Performance Indicators:

_____ Accounts for the vertical asymptote.

_____ Accounts for the x-coordinate of the hole.

_____ Accounts for the horizontal asymptote.

_____ Accounts for the y-coordinate of the hole.

_____ Writes the completed function.

Scoring Rubric:

Level 4: Student solves problems correctly and gives good explanations.

Level 3: Student solves problems but does not give satisfactory explanations.

Level 2: Student solves some problems but does not give satisfactory explanations.

Level 1: Student is not able to solve any of the problems.

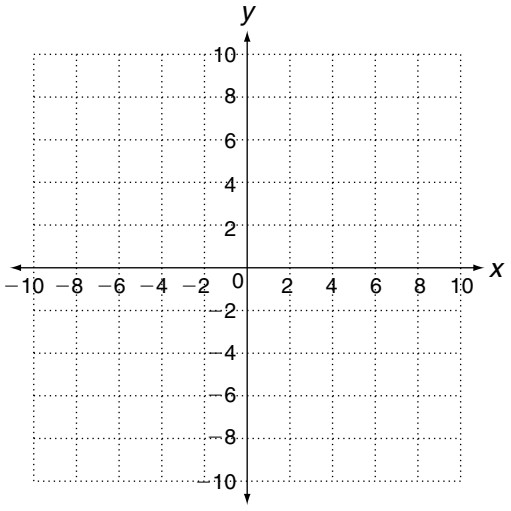
Name _____ Date _____ Class _____

CHAPTER 8

Performance Assessment

Rational and Radical Functions

A rational function, $R(x)$ has the following characteristics: a vertical asymptote at $x = 3$, a horizontal asymptote at $y = 2$, and a hole at $(2, -2)$. Sketch the function and determine what it could be.



1. Put in the factor that would account for the vertical asymptote at $x = 3$.

_____

2. Add in the factors that would account for a hole at $x = 2$.

_____

3. Determine what must be true about the numerator and denominator for there to be a horizontal asymptote at $y = 2$.

_____

4. Add the factors that would account for the horizontal asymptote at $y = 2$.

_____

5. Describe what you must do in order for the hole to appear at $(2, -2)$.

_____

6. Find a.

_____

7. Write the completed function.

_____

Chapter Test Form C

1. $Q = \frac{kPT}{R}$; Q varies jointly with P and T and inversely with R.
2. $\frac{9}{20}$ or 0.45
3. $A = \frac{k}{BC}$; A varies inversely with the product of B and C.
4. $2x^2 - 4x - 30$
5. $\{-4\}$
6. $\frac{2x}{1 - x^2}$
7. $\frac{x - 1}{x + 1}$
8. 7.5 mph
9. $a < -5$
10. HA at $y = \frac{9}{4}$; VA at $x = \pm\frac{3}{2}$
11. $(2, -6)$
12. $f(x) = \frac{2x^2 - 4x - 48}{x^2 - 7x + 6}$
13. $\left\{\frac{24}{23}, 4\right\}$
14. 6 hours
15. $x^{-\frac{1}{6}} y^{\frac{7}{6}}$
16. 4
17. $g(x) = \sqrt{-\frac{1}{2}x - 2} - 1$
18. $a = 2, b = -\frac{3}{4}$
19. $\left\{-\frac{4}{3}\right\}$
20. $\{-1, 4\}$

Performance Assessment

1. $R(x) = \frac{}{(x - 3)}$
2. $R(x) = \frac{(x - 2)}{(x - 3)(x - 2)}$
3. The numerator and denominator must have the same degree, and the leading coefficient of the numerator must be two times the leading coefficient of the denominator.
4. $R(x) = \frac{2(x - a)(x - 2)}{(x - 3)(x - 2)}$
5. For the function $R'(x) = \frac{2(x - a)}{(x - 3)}$, $R'(2) = -2$.
6. $\frac{2(2 - a)}{(2 - 3)} = -2$; $\frac{4 - 2a}{-1} = -2$; $4 - 2a = 2$; $a = 1$.
7. $R(x) = \frac{2(x - 1)(x - 2)}{(x - 3)(x - 2)} = \frac{2x^2 - 6x + 4}{x^2 - 5x + 6}$

Cumulative Test

1. A
2. G
3. C
4. F
5. C
6. G
7. D
8. J
9. A
10. H
11. C
12. H
13. D
14. H
15. C
16. H
17. B
18. G
19. C
20. F