Name _____ Date _____ Class _____

Performance Assessment Teacher Support
Foundations for Functions

Purpose:
To assess student understanding of sets of numbers and their properties; simplifying algebraic expressions and exponents; and functions and their graphs.

Time:
20–30 minutes

Grouping:
Individuals or partners

Preparation Hints:
Review the properties of exponents and function notation.

Introduce the Task:
Three roofs are to be painted. Students are asked to create a function that gives the total area to be painted and find a reasonable domain, range, and parent for the function. They describe what an input of 200 into the function represents, and write the value of the function for that input using scientific notation.

Performance Indicators:

_____ Writes correct function.

_____ Determines reasonable domain and range of function.

_____ Identifies parent function.

_____ Explains meaning of $f(200)$ in context.

_____ Uses properties of exponents to write $f(200)$ in scientific notation.

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.

Holt Algebra 2

Name _____ Date _____ Class _____

Performance Assessment
Foundations for Functions

Painters will be painting three roofs. They do not know the actual sizes of the three roofs, but they do know the roofs are square and look like the drawings below.
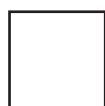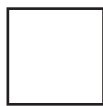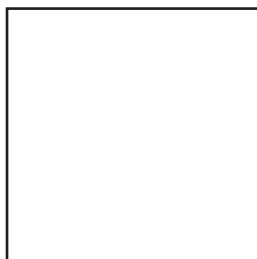
x ft x ft $2x$ ft

1. Write a function $f(x)$ that shows the total amount to be painted. Combine all like terms in the function rule.

   _____

2. What are a reasonable domain and range of the function $f(x)$ that show the total amount to be painted?

   _____

3. Identify the parent function for $f(x)$ from its function rule.

   _____

4. What does $f(200)$ represent?

   _____

   _____

5. Find the value of $f(200)$ and write the answer in scientific notation.

   _____

Holt Algebra 2

Answer Key continued

8. $-\dfrac{75}{12}$

9. $10x$

10. $\dfrac{1}{12}$

11. $\dfrac{27y^6}{x^{24}}$

12. 1.6×10^{-4}

13. D: $\{x \mid x \neq 0\}$ R: $\{0 < f(x) < \infty\}$

14. $a \neq 2$, $a \neq 4$, $a \neq 1$

15. $f(0) = 3$, $f\left(\dfrac{1}{2}\right) = 0$, $f(h + 4) = -6h - 21$

16. $T(h) = 35 + 25h$, $T(3) = 110$, total miles east after 3 hours

17. graph should have x-coordinates doubled and negative of y-coordinates

18. $(6, 1)$ and $(-12, 5)$

19. quadratic, translated left 2 units and reflected across x-axis

20. about hour 7.3

Performance Assessment

1. $f(x) = 6x^2$

2. Domain $x > 0$, $x \in \square$, Range $y > 0$, $y \in \square$.

3. The parent function is the quadratic function.

4. It represents the total area of the squares if the side of one of the smaller squares measures 200 ft.

5. $f(200) = 2.4 \times 10^5$

Cumulative Test

1. C

2. G

3. A

4. H

5. B

6. J

7. C

8. F

9. D

10. G

11. D

12. F

13. B

14. H

15. D

16. H

17. B

18. F

19. A

20. J

21. B

22. J

23. C

24. H

25. B

26. H

27. A

28. G

29. C

30. H

31. A

32. G

33. D

34. J

35. D

36. G

37. C

38. H

Holt Algebra 2