

Name: _____
Algebra 1

Date: _____
Band: _____

Unit 11: Rational Expressions & Equations Performance Tasks

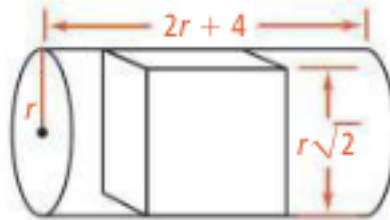
Instructions: Choose one performance task. Write all your work on a separate clean piece of paper and attach it to this page.

Big Idea: Equivalence

Rational expressions can be represented in many ways. When a rational expression is simplified, the numerator and denominator have no common factors except 1.

Performance Task 1

A cylinder with radius r and height $2r + 4$ contains a cube with edge length $r\sqrt{2}$, as shown. What fraction of the cylinder's volume is taken up by the cube? Write your answer in simplified form.



Big Idea: Functions

Rational functions have equations of the form $f(x) = \frac{\text{polynomial}}{\text{polynomial}}$. The graph of a rational function may have vertical and horizontal asymptotes.

Performance Task 2

In a bike race, a rider covers a 5-mi flat stretch of road at a speed of s mi/h. She then doubles her speed down a hill 1 mi long. Finally, she reduces her downhill speed by 12 mi/h as she rides the last 3 mi of the race. What function gives the time t it takes the rider to finish the race in terms of s ?

Big Idea: Solving Equations and Inequalities

To isolate the variable in a rational equation, multiply each side by the LCD and then solve the resulting equation. Check for extraneous solutions.

Performance Task 3

A restaurant has 45 tables. Each table seats 4 people. The manager has 4 employees to prepare the tables. The chart shows how fast each employee works. Use this information to answer the following questions.

- In order to get the tables ready in the least amount of time, which two employees should the manager ask to fold napkins? Which two employees should the manager ask to set the tables?
- If everyone starts working at the same time, how quickly can the employees get the tables ready for dinner? The first pair of employees to finish their job should help the other pair to finish the tables. Explain your answer.

Employee	Time to Fold 4 Napkins (min)	Time to Set 4 Places (min)
Stacie	3	5
Jeff	4	3
Tiffany	5	2
Nick	3.5	4

Performance Task Assessment: Analytic Holistic Scoring

Developing Autonomy—The student

3	Persevered to complete the problem without help
2	Completed most of the problem without help
1	Needed key hints to complete the problem
0	Needed extensive guidance to work the problem

The Solution Process—The student's work showed

3	A complete and appropriate solution process
2	An appropriate solution process that is almost complete
1	An appropriate process that is partially complete
0	An inappropriate process or no evidence of a process

The Conclusion/Answer—The student's answer is an

3	Accurate conclusion, supported by valid evidence and reasons, appropriate to this problem and context
2	Inaccurate but logical conclusion, supported by evidence and reasoning but incorrect due to a minor factual error (in details of problem, in computation, recall a formula, etc.) or minor mistake in reasoning
1	Inaccurate but logical conclusion that overlooks, or gets wrong significant facts (about the problem, the rule, computation, etc.)
0	Inappropriate conclusion: not supported by facts and logic, or there is no conclusion

Teacher Comments: