

4.7 We All Scream for Ice Cream

A Practice Understanding Task



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The Glacier Bowl is an enormous ice cream treat sold at the neighborhood ice cream parlor. It is so large that any person who can eat it within 30 minutes gets a t-shirt and his picture posted on a wall. Because the Glacier Bowl is so big, it costs \$60 and most people split the treat with a group.

Amera and some of her friends are planning to get together to share the bowl of ice cream. They plan to split the cost between them equally.

1. What is an algebraic expression for the amount that each person in the group will pay?
2. At the last minute, one of the friends couldn't go with the group. Write an expression that represents the amount that each person in the group now pays.
3. It turns out that each person in the group had to pay \$2 more than they would have if everyone in the original group had shared the ice cream. How many people were in the original group?

4. Explain why your answer(s) makes sense in this situation.

This story and the problem it represents provides an opportunity to model a situation that requires a rational equation. Rational equations can take many forms, but they are solved using principles we have worked with before. Try applying some of the strategies for working with rational expressions that we have used in this module to solve these equations.

5. $\frac{2}{x+4} - \frac{1}{x} = \frac{2}{3x}$

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

7. $x + \frac{20}{x-4} = \frac{5x}{x-4} - 2$

8. $\frac{x}{x+3} - \frac{4}{x-2} = \frac{-5x^2}{x^2+x-6}$

READY, SET, GO!

Name _____

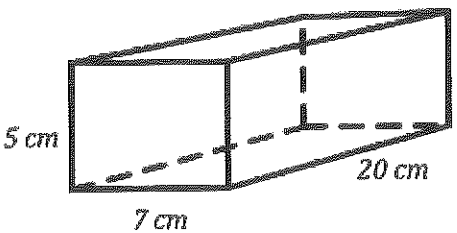
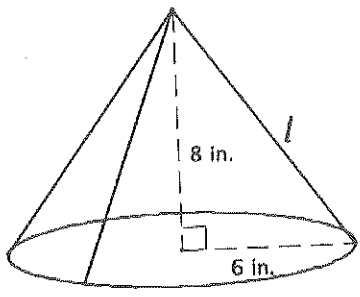
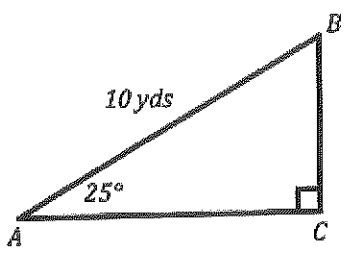
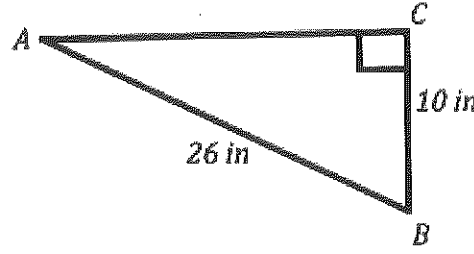
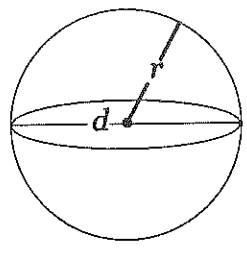
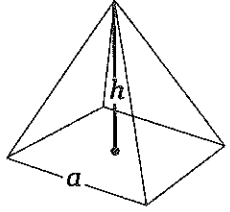
Period _____

Date _____

READY

Topic: Calculating volume, surface area and solving right triangles

Find the indicated values for the geometric figures below.

<p>1. Volume: Surface Area:</p>  <p>rectangular prism</p>	<p>2. Volume: $V = \frac{1}{3}bh$ Surface Area: $S_A = \pi r(l + r)$ where l is the lateral height.</p>  <p>right cone</p>
<p>3. Solve the right triangle. $\angle B =$ $\overline{AC} =$ $\overline{BC} =$</p> 	<p>4. Solve the right triangle. $\angle B =$ $\angle A =$ $\overline{AC} =$</p> 
<p>5. Volume: $V = \frac{4}{3}\pi r^3$ Surface area: $S_A = 4\pi r^2$</p> <p>$r \approx 3959$ miles</p>  <p>sphere This is the radius of the earth.</p>	<p>6. Volume: $V = a^2 \frac{h}{3}$ Surface area: $S_A = a^2 + 2a\sqrt{\frac{a^2}{4} + h^2}$</p> <p>$h = 147$ m $a = 230$ m</p>  <p>right square pyramid These are the dimensions of the great pyramid of Giza.</p>

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SET

Topic: Solving rational equations

Solve each equation. Identify extraneous solutions.

7. $x + \frac{2}{x} = 3$

8. $\frac{x}{2} - \frac{1}{3x} = \frac{1}{6}$

9. $2x + \frac{3}{x+2} = 1$

10. $\frac{2}{x^2-2x} - \frac{1}{x-2} = 1$

11. $3x - \frac{1}{2x-1} = 4$

12. $\frac{2x}{x^2+3x} - \frac{2}{x+3} = \frac{2}{x}$

Topic: Using work and rate relationships to solve problems

13. Channing takes twice as long as Dakota to complete a school project. It takes them 15 hours to complete the project together. How long would it take each student to complete the project if he works alone?
14. A print shop can print the MVP math book in 24 minutes if both of their print machines are working together to do the job. If a print machine is working alone, the job takes longer. Machine A can print the book 20 minutes faster than machine B. How long does it take each machine to print the book?

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15. The problem in #14 generates an extraneous solution, even though neither solution makes a denominator equal zero. What is another reason for having an extraneous solution?

GO

Topic: Simplifying rational expressions

(10 – 11) Reduce to simplest form. (12 – 15) Perform the indicated operations. Reduce each of your answers to its simplest form. (Assume all denominators $\neq 0$)

16.

$$\frac{x^2 + 8x + 12}{x^2 + 3x - 18}$$

17.

$$\frac{x^2 - 3x - 40}{x^2 - 11x + 24}$$

18.

$$\frac{x^2 + 8x + 12}{x^2 + 3x - 18} + \frac{x^2 - 3x - 40}{x^2 - 11x + 24}$$

19.

$$\frac{x^2 + 5x - 36}{(x - 4)} \cdot \frac{3(x + 2)}{x + 9}$$

20.

$$\frac{4}{x^2 - 4} - \frac{1}{x - 2}$$

21.

$$\frac{x^2 - 2x - 3}{x + 1} \div \frac{x - 3}{5}$$

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