

Grade 7  
Session 3, Item 2  
Item ID: 935130

A gas station lets a jazz band rent its parking lot for the weekend to put on a car wash. The jazz band is washing cars to earn money for a trip. Reid mixes soap with water for the car wash. He uses the same amount of soap for each gallon of water. Some amounts of water and soap he could mix are shown in the table.

**Water and Soap Mixtures**

Water (gallons)	Soap (cups)
$\frac{1}{2}$	$\frac{1}{8}$
$1\frac{1}{2}$	$\frac{3}{8}$
3	$\frac{3}{4}$

Each person who gets his or her car washed pays a minimum of \$5, but people can pay more to help the jazz band. The first 7 payments are listed below.

**Car Wash Payments**

\$5, \$6, \$10, \$10, \$15, \$20, \$25

The person who paid \$20 and the person who paid \$25 are both parents of jazz band members.

Use the **Water and Soap Mixtures** table to answer the question.

Reid represents the unit rate in terms of cups of soap per gallon of water. Justify that the quantities of soap and water listed in the table are proportional.

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**Maximum Number of Points: 1**

Alignment: 7.RP.A.2.a

- Analyze proportional relationships and use them to solve problems.
  - Recognize and represent proportional relationships between quantities.
    - Determine when two quantities are in a proportional relationship.

SAMPLE CORRECT EXPLANATION:

- If I divide  $\frac{1}{8}$  by  $\frac{1}{2}$ , I get  $\frac{1}{4}$ , so there is  $\frac{1}{4}$  cup of soap per gallon, based on the first row. Also,  $\frac{3}{8} \div \frac{3}{2} = \frac{3}{8} \times \frac{2}{3} = \frac{1}{4}$ . Also,  $\frac{3}{4} \div 3 = \frac{3}{4} \times \frac{1}{3} = \frac{1}{4}$ . Since the quotient of each pair is the same, the values are proportional.

1 Point

- Student uses valid mathematical reasoning to show that the values in the table are proportional.

0 Points

- Blank  
–OR–
- Student does not use valid mathematical reasoning to show that the values in the table are proportional.

Grade 7

Session 3, Item 5

Item ID: 935133

A gas station lets a jazz band rent its parking lot for the weekend to put on a car wash. The jazz band is washing cars to earn money for a trip. Reid mixes soap with water for the car wash. He uses the same amount of soap for each gallon of water. Some amounts of water and soap he could mix are shown in the table.

**Water and Soap Mixtures**

Water (gallons)	Soap (cups)
$\frac{1}{2}$	$\frac{1}{8}$
$1\frac{1}{2}$	$\frac{3}{8}$
3	$\frac{3}{4}$

Each person who gets his or her car washed pays a minimum of \$5, but people can pay more to help the jazz band. The first 7 payments are listed below.

**Car Wash Payments**

\$5, \$6, \$10, \$10, \$15, \$20, \$25

The person who paid \$20 and the person who paid \$25 are both parents of jazz band members.

Use the **Car Wash Payments** list to answer the question.

Jenna finds the mean of the first 7 car wash payments. Reid removes \$20 and \$25 from the data set. After removing the values, he finds the mean of the remaining car wash payments. They each use the means they find to make an estimate of how much money they will earn if they wash 100 cars. By how much is Jenna's estimate greater than Reid's estimate? Show or explain your work.

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**Maximum Number of Points: 2**

Alignment: 7.DSP.A.2

- Use random sampling to draw inferences about a population.
  - Use data from multiple samples to draw inferences about a population and investigate variability in estimates of the characteristic of interest.

CORRECT ANSWER:

- \$380

SAMPLE CORRECT EXPLANATION:

- Jenna's data set has a sum of \$91 and 7 values, so her mean is  $91 \div 7 = 13$ . Reid's data set has a sum of \$46 but only 5 values, so his mean is  $46 \div 5 = 9.2$ . I multiplied each mean by 100 to get 1300 and 920, and then did  $1300 - 920 = 380$  to get the difference in estimates.

2 Points

- Student determines the correct answer and provides a valid mathematical explanation or work.

1 Point

- Student determines the correct answer but does not provide a valid mathematical explanation or work.

–OR–

- Student does not determine the correct answer but does provide a valid mathematical explanation or work.

0 Points

- Blank
  - OR–
- Student does not determine the correct answer and does not provide a valid mathematical explanation or work.