## Formative Assessments
### Proportional Reasoning Cluster
#### Assessment One

<table>
<thead>
<tr>
<th>Cluster &amp; Content Standards</th>
<th>Mathematical Practice Standards</th>
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</thead>
<tbody>
<tr>
<td><em>What content standards can be addressed by this formative assessment?</em></td>
<td><em>What practice standards can be addressed by this formative assessment?</em></td>
</tr>
<tr>
<td>Ratio and Proportional Reasoning</td>
<td></td>
</tr>
<tr>
<td>NC. 7. RP. 2 Recognize and represent proportional relationships between quantities.</td>
<td>MP1 Make sense of problems and persevere in solving them.</td>
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<tr>
<td>• Recognize whether ratios are in a proportional relationship using tables and graphs.</td>
<td>MP4 Model with mathematics.</td>
</tr>
<tr>
<td></td>
<td>MP7 Look for and make use of structure.</td>
</tr>
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</table>

<table>
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<tr>
<th>Learning Targets</th>
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<td>Unit Rates</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Timing</th>
<th>During Instruction</th>
</tr>
</thead>
</table>

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ASSESSMENT ONE

1. A can of concentrated fruit punch includes instructions “Mix one can of concentrate with 3 cans of cold water.”

Find the missing value in each situation below. Provide evidence for your answers.

<table>
<thead>
<tr>
<th>6 cans of concentrate : ______________ cans of water</th>
<th>24 cans of water : _______________ cans of concentrate</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 1/2 cans of concentrate : ____________ cans of water</td>
<td>10 cans of concentrate : _______________ cans of fruit punch</td>
</tr>
</tbody>
</table>

2. Jim is a member of the student council and is in charge of the “Welcome Back to School” dance. Jim wanted to figure out how many cans of concentrate he would need if he was responsible for beverages at the 7th grade “Welcome Back to School” dance. He knew that the coolers he planned to use could hold 144 cups of “stuff” (1 cup of water = 1 can of water). He used the following strategy to figure out how many cans of concentrate he needed. Jamie was also on this committee, but she used a similar strategy but came up with a different amount of concentrate needed. Who do you agree with? Explain why you agree with this person.

Jim
I wrote a series of equivalent fractions using a ratio table

<table>
<thead>
<tr>
<th>Cans of concentrate</th>
<th>1</th>
<th>2</th>
<th>4</th>
<th>48</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cans of water</td>
<td>3</td>
<td>6</td>
<td>12</td>
<td>144</td>
</tr>
</tbody>
</table>

Jim says that 48 cans of concentrate are needed for the punch at the dance.

Jamie
I also wrote a series of fractions using a ratio table

<table>
<thead>
<tr>
<th>Cans of concentrate</th>
<th>1</th>
<th>3</th>
<th>36</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cans of “stuff”</td>
<td>4</td>
<td>12</td>
<td>144</td>
</tr>
</tbody>
</table>

Jamie says that the committee needs to buy 36 cans of concentrate for the dance.

Think of an alternate way to help Jim and Jamie to figure out how many cans of concentrate they need to buy for the dance.
Anticipated Student Reasoning

1. picture

<table>
<thead>
<tr>
<th>Long table</th>
<th>Short table</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8 cans

\[ \text{10.5 cans water} \]

\[ \text{4 cans punch} \]

\[ \text{40} \times \frac{1}{4} = 40 \]
2. Jim is a member of the student council and is in charge of the "Welcome Back to School" dance. Jim wanted to figure out how many cans of concentrate he would need if he was responsible for beverages at the 7th grade "Welcome Back to School" dance. He knew that the coolers he planned to use could hold 144 cups of "stuff" (1 cup of water = 1 can of water). He used the following strategy to figure out how many cans of concentrate he needed. Jamie was also on this committee, but she used a similar strategy but came up with a different amount of concentrate needed. Who do you agree with? Explain why you agree with this person. Though both Jim and Jamie’s strategies are mathematically sound, I agree with Jamie because the cooler can only hold 144 cups. When Jamie gets 144 he has 144 cups of water and he would need to add the punch.

<table>
<thead>
<tr>
<th>Cans of concentrate</th>
<th>1</th>
<th>2</th>
<th>4</th>
<th>48</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cans of water</td>
<td>3</td>
<td>6</td>
<td>12</td>
<td>144</td>
</tr>
</tbody>
</table>

Jim says that 48 cans of concentrate are needed for the punch at the dance.

Jim also wrote a series of fractions using a ratio table.

<table>
<thead>
<tr>
<th>Cans of concentrate</th>
<th>1</th>
<th>3</th>
<th>36</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cans of &quot;stuff&quot;</td>
<td>4</td>
<td>12</td>
<td>144</td>
</tr>
</tbody>
</table>

Jamie says that the committee needs to buy 36 cans of concentrate for the dance.

Think of an alternate way to help Jim and Jamie to figure out how many cans of concentrate they need to buy for the dance.

Can use a proportion: 
\[
\frac{1}{4} = \frac{x}{144} \quad \text{or} \quad \frac{1}{3} = \frac{2}{144-x}
\]

Draw & Extend a pic:

\[
\text{Wwww} \quad \text{2 cups concentrate} \quad \frac{2}{140} = \frac{360}{18} = \frac{108}{54}
\]

You would need 16 of these pictures.

\[
\frac{144}{144} = 1
\]
## Formative Assessments
### Proportional Reasoning Cluster
#### Assessment Two

### Cluster & Content Standards
**What content standards can be addressed by this formative assessment?**
Ratios and Proportional Reasoning

NC. 7. RP.1 Compute unit rates associated with ratios of fractions to solve real-world and mathematical problems.

NC. 7. RP.2 Recognize and represent proportional relationships between quantities.
1. Understand that a proportion is a relationship of equality between ratios.
   - Represent proportional relationships using tables and graphs.
   - Recognize whether ratios are in a proportional relationship using tables and graphs.
   - Compare two different proportional relationships using tables, graphs, equations, and verbal descriptions.
     - Identify the unit rate (constant of proportionality) within two quantities in a proportional relationship using tables, graphs, equations, and verbal descriptions.
     - Create equations and graphs to represent proportional relationships.
     - Use a graphical representation of a proportional relationship in context to:
       - Explain the meaning of any point \((x, y)\).
       - Explain the meaning of \((0, 0)\) and why it is included.
       - Understand that the \(y\)-coordinate of the ordered pair \((1, r)\) corresponds to the unit rate and explain its meaning.

### Mathematical Practice Standards
**What practice standards can be addressed by this formative assessment?**

MP2 Reason abstractly and quantitatively.

MP3 Construct viable arguments and critique the reasoning of others.

MP4 Model with mathematics.

### Learning Targets
**What learning targets will be assessed?**
Recognizing and representing proportional relationships
Representing and recognizing proportional relationships in tables
Representing and recognizing proportional relationships in graphs

### Timing: During Instruction
ASSESSMENT TWO

1. Write your own word problem that must be solved using ratios and proportions.

2. Create a table of values and a graph that models your “real-world” situation.

3. Pick one of your points in your table of values and explain its meaning in the context of your situation.

4. Explain how you know that your situation is proportional?
Anticipated Responses/Strategies:

Generate a “real-world” situation that is proportional.

Jill earns $7.50 per hour at Chick-Fil-A.

Create a table of values and a graph that models your “real-world” situation:

<table>
<thead>
<tr>
<th>hours</th>
<th>$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>7.50</td>
</tr>
<tr>
<td>2</td>
<td>15.00</td>
</tr>
<tr>
<td>3</td>
<td>22.50</td>
</tr>
<tr>
<td>4</td>
<td>30.00</td>
</tr>
</tbody>
</table>

Pick one of your points in your table of values and explain its meaning in the context of your situation.

$(2, 15)$ If Jill works 2 hours she will earn $15.00.

Explain how you know that your situation is proportional:

I can always take the # of hours times $7.50 to get Jill's earnings.
Also at 0 hours Jill earns 0 dollars.
# Formative Assessments

## Proportional Reasoning Cluster

### Assessment Three

<table>
<thead>
<tr>
<th>Cluster &amp; Content Standards</th>
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</tr>
</thead>
<tbody>
<tr>
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<td><strong>What practice standards can be addressed by this formative assessment?</strong></td>
</tr>
<tr>
<td>Ratios and Proportional Reasoning</td>
<td>MP1  Make sense of problems and persevere in solving them.</td>
</tr>
<tr>
<td>NC. 7. RP.1  Compute unit rates associated with ratios of fractions to solve real-world and mathematical problems.</td>
<td>MP2  Reason abstractly and quantitatively.</td>
</tr>
<tr>
<td>NC. 7. RP. 2  Recognize and represent proportional relationships between quantities.</td>
<td>MP3  Construct viable arguments and critique the reasoning of others.</td>
</tr>
<tr>
<td>1. Understand that a proportion is a relationship of equality between ratios.</td>
<td>MP4  Model with mathematics.</td>
</tr>
<tr>
<td>• Represent proportional relationships using tables and graphs.</td>
<td>MP6  Attend to precision.</td>
</tr>
<tr>
<td>• Recognize whether ratios are in a proportional relationship using tables and graphs.</td>
<td></td>
</tr>
<tr>
<td>• Compare two different proportional relationships using tables, graphs, equations, and verbal descriptions.</td>
<td></td>
</tr>
<tr>
<td>• Identify the unit rate (constant of proportionality) within two quantities in a proportional relationship using tables, graphs, equations, and verbal descriptions.</td>
<td></td>
</tr>
<tr>
<td>• Create equations and graphs to represent proportional relationships.</td>
<td></td>
</tr>
<tr>
<td>• Use a graphical representation of a proportional relationship in context to:</td>
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<tr>
<td>• Explain the meaning of any point (x, y).</td>
<td></td>
</tr>
<tr>
<td>• Explain the meaning of (0, 0) and why it is included.</td>
<td></td>
</tr>
<tr>
<td>• Understand that the y-coordinate of the ordered pair (1, r) corresponds to the unit rate and explain its meaning.</td>
<td></td>
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</table>

### Learning Targets

**What learning targets will be assessed?**

- **Unit Rates**
- **Constants of Proportionality**

Identify proportional relationships within tables, graphs, and equations.

### Timing: During Instruction
ASSESSMENT THREE

1. A local market sells 4 tomatoes for $3.20.
   a. Complete the table below.

<table>
<thead>
<tr>
<th>number of tomatoes (t)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost (C)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

b. How much would it cost you to buy 100 tomatoes? Explain how you arrived at your answer.

c. How many tomatoes could you buy for $12? Explain how you arrived at your answer.

d. Sketch and describe a graph of what your data would look like. Name a point on your graph and describe that points meaning in the context of this situation.

e. What is the constant of proportionality? Explain how you know?

f. Write an equation that relates the number of tomatoes, \( t \), to the cost, \( C \).
Problem #2

Emily leaves her house at exactly 8:25 am to bike to her school, which is 3.42 miles away. While she passes the post office, which is $\frac{3}{4}$ of a mile away from her home, she looks at her watch and sees it is 30 seconds past 8:29 am.

If Emily’s school starts at 8:50 am, can Emily make it to school on time without increasing her rate of speed? Show and/or explain the work necessary to support your answer.
Problem #2 taken from SBAC Mathematics Practice Test item #3286

Anticipated Responses/Strategies:

A local market sells 4 tomatoes for $3.20.

- Complete the table below.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>.80</td>
<td>1.60</td>
<td>2.40</td>
<td>3.20</td>
<td>4.00</td>
</tr>
</tbody>
</table>

- How much would it cost you to buy 100 tomatoes? Explain how you arrived at your answer.

\[
\text{total cost} = \frac{100 \times .80}{.80} = 80
\]

- How many tomatoes could you buy for $12? Explain how you arrived at your answer.

\[
\frac{12}{.80} \times 100 = 15 \text{ tomatoes}
\]

- Sketch and describe a graph of what your data would look like. Name a point on your graph and describe that point's meaning in the context of this situation.

\[
(2, 1.60) \quad 2 \text{ tomatoes cost } $1.60
\]
What is the constant of proportionality? Explain how you know.

\[ \frac{80}{1} = \text{cost} \]

Every tomato costs $80. I can multiply the number of tomatoes by 8 and always get the correct total.

Write an equation that relates the number of tomatoes, \( t \), to the cost, \( C \).

\[ C = 8t \]

Problem #2

Emily leaves her house at exactly 8:25 am to bike to her school, which is 3.42 miles away. While she passes the post office, which is \( \frac{3}{4} \) of a mile away from her home, she looks at her watch and sees that is 30 seconds past 8:25 am.

8:25 to 8:50 is 25 minutes. This indicates it should take about 21 minutes to get there.

If Emily’s school starts at 8:50 am, can Emily make it to school on time without increasing her rate of speed? Show and explain the work necessary to support your answer.

If Emily makes it in 20.52 minutes, then

\[ \frac{3}{4} \text{ mile per minute} \]

\[ 1.5 \text{ miles per minute} \]

\[ 2.5 \text{ miles per minute} \]

\[ 3.42 \text{ miles per minute} \]

\[ \frac{3}{3} \text{ miles in 6 minutes} \]

\[ 4 \text{ miles in 6 minutes} \]

\[ 4 \times 3.42 \text{ miles} \]

\[ 13.68 \text{ miles} \]

\[ 20.52 \text{ minutes} \]

\[ 20.52 - 4.5 = 16.02 \]

\[ 8.24:30 \pm 8:50 \]

So yes!
# Formative Assessments

**Proportional Reasoning Cluster**  
Assessment Four

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<td></td>
</tr>
<tr>
<td>NC. 7. RP.1  Compute unit rates associated with ratios of fractions to solve real-world and mathematical problems.</td>
<td>MP1  Make sense of problems and persevere in solving them.</td>
</tr>
</tbody>
</table>
| NC. 7. RP.2  Recognize and represent proportional relationships between quantities.  
1. Understand that a proportion is a relationship of equality between ratios. | MP2  Reason abstractly and quantitatively. |
| - Represent proportional relationships using tables and graphs. | MP3  Construct viable arguments and critique the reasoning of others. |
| - Recognize whether ratios are in a proportional relationship using tables and graphs. | MP4  Model with mathematics. |
| - Compare two different proportional relationships using tables, graphs, equations, and verbal descriptions. | MP6  Attend to Precision |
|  - Identify the unit rate (constant of proportionality) within two quantities in a proportional relationship using tables, graphs, equations, and verbal descriptions. | MP7  Look for and make use of structure. |
|  - Create equations and graphs to represent proportional relationships. | |
|  - Use a graphical representation of a proportional relationship in context to: | |
|  - Explain the meaning of any point (x, y). | |
|  - Explain the meaning of (0, 0) and why it is included. | |
|  - Understand that the y-coordinate of the ordered pair (1, r) corresponds to the unit rate and explain its meaning. | |

| Learning Targets | |
| What learning targets will be assessed? | |
| Unit Rates | |
| Proportional relationships in tables, graphs, and equations | |

**Timing:** During Instruction
Assessment Four

Jimmy, Elvis, and Ricky all have after-school jobs at a local-fast food restaurant. They each have the money they earned last week.

<table>
<thead>
<tr>
<th>Jimmy</th>
<th>Elvis</th>
<th>Ricky</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of hours worked</td>
<td>Money earned</td>
<td>Ricky makes $7 per hour.</td>
</tr>
<tr>
<td>1.5 hours</td>
<td>$11.25</td>
<td></td>
</tr>
<tr>
<td>3.5 hours</td>
<td>$26.25</td>
<td></td>
</tr>
<tr>
<td>5 hours</td>
<td>$37.50</td>
<td></td>
</tr>
</tbody>
</table>

1. Who makes more money for working 8 hours? Explain or show your work.

2. Draw a graph that represents the money (y) Ricky would earn for working x hours. On the same axes, draw a graph that represents the money Jimmy would earn for working x hours. Compare the graphs of Jimmy and Ricky. Can you tell who makes the most money JUST by looking at the graphs? Explain your answer.

3. Write an equation showing the amount of money EACH PERSON would earn, y, for working x hours. From looking at the equations, explain how you know who makes the most money for working the same amount of hours.
Anticipated Responses/Strategies:

Jimmy, Elvis, and Ricky all have after-school jobs at a local fast-food restaurant. They each have the money they earned this week.

### Jimmy

<table>
<thead>
<tr>
<th>Number of hours worked</th>
<th>Money earned</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5 hours</td>
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<td>$26.25</td>
</tr>
<tr>
<td>5 hours</td>
<td>$37.50</td>
</tr>
</tbody>
</table>

* Ricky know that he makes $7.00 per hour.

- $7 \times 8 = 56$

- Who makes more money for working 8 hours? Explain or show your work.
  - Could extend table and graph
  - Could find unit rate

```
Jimmy
```
• Draw a graph that represents \( y \), the money Ricky would earn for working \( x \) hours, if he makes the same hourly rate.

\[
\begin{array}{c|c}
\text{hours} & \text{dollars} \\
0 & 1 \\
1 & 14 \\
2 & 28 \\
3 & 42 \\
4 & 56 \\
\end{array}
\]

• On the same coordinate plane, draw a graph that represents \( y \), the money Jimmy would earn for working \( x \) hours, if he makes the same hourly rate.

• Compare the graphs of Jimmy and Ricky. Can you tell who makes the most money by looking at the graphs? Explain your answer.

  Jimmy makes more because I can see his line is always higher than Ricky’s.

• Write an equation showing the amount of money each would earn, \( y \), for working \( x \) hours. From looking at the equations, explain how you know who makes the most money for working the same amount of hours.

  Jimmy: \( y = 7.50x \)
  Ricky: \( y = 7x \)

  The amount per hour for Jimmy is more. So if I plugged in 10 hrs. Jimmy would make $75 and Ricky would only make $70.
# Formative Assessments

## Proportional Reasoning Cluster

### Assessment Five

<table>
<thead>
<tr>
<th>Cluster &amp; Content Standards</th>
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<tbody>
<tr>
<td><em>What content standards can be addressed by this formative assessment?</em></td>
<td><em>What practice standards can be addressed by this formative assessment?</em></td>
</tr>
<tr>
<td>Ratios and Proportional Reasoning</td>
<td>MP2  Reason abstractly and quantitatively.</td>
</tr>
<tr>
<td><strong>NC.7.RP.3</strong> Use scale factors and unit rates in proportional relationships to solve ratio and percent problems.</td>
<td>MP3  Construct viable arguments and critique the reasoning of others.</td>
</tr>
<tr>
<td></td>
<td>MP4  Model with mathematics.</td>
</tr>
<tr>
<td></td>
<td>MP6  Attend to precision.</td>
</tr>
</tbody>
</table>

### Learning Targets

*What learning targets will be assessed?*
- Unit Rates
- Percents (discounts, sales tax, and commission)

### Timing

During Instruction
Assessment Five

Question #1
Jimmy bought a $29 meal. He knows that sales tax in his state is 5%. Jimmy knows that sales tax can be calculated several different ways, which are listed below. Which of Jimmy’s methods is correct? Please give evidence for supporting why these methods are correct.

Method 1
5% sales tax means for every dollar you spend, you are charged five cents ($0.05) sales tax. Since I am buying a meal that cost $29, I should be charged five cents 29 times. So cents, so my sales tax is $1.45.

Method 2
I could set up a proportion
\[
\frac{0.05}{1.00} = \frac{x}{29.00}
\]
All I need to do is solve for the missing value, x.

Method 3
I know that 10% of 29 is $2.90. Since 5% is half of 10%, the sales tax should be half of $2.90

Method 4
1% of 29 is $0.29, so 5% would be 5 times $0.29.

Method 5
I know that 5% = , so 5% of $29 is .

Of the correct methods, which one makes the most sense to you? Explain your choice.
**Question #2**
Jimmy purchased three video games for his X-box. The video games all cost the same amount. He paid 8% sales tax. He could see on receipt that $9.36 was added to his purchase. What was the cost of 1 video game, not including tax? Show your work below.

**Question #3**
Alfonso went to Sam’s Famous Appliance Store and purchased a refrigerator and a stove. The sales price of the refrigerator was 40% off the original price and the sales price of the stove was 20% off the original price.

Which statement must be true to conclude that Alfonso received a 30% discount on the refrigerator and stove together? Explain why the statement is correct.

A. The sale prices of the refrigerator and the stove was the same.
B. The original prices of the refrigerator and the stove was the same.
C. The sale price of the refrigerator was twice the sale price of the stove.
D. The original price of the refrigerator was twice the original price of the stove.

Problem #2 taken from SBAC Mathematics Practice Test item #3635
Anticipated Responses/Strategies:

Method 1
\[
\frac{5\%}{100} = \frac{5}{100} = .05
\]

\[
\times .29
\]

\[
\times .29
\]

Method 2
\[
\frac{.05 \times .29}{1.00} = \frac{.05 \times .29}{1.00} = \frac{1.45}{29} = .05
\]

Method 3
\[
\frac{5\%}{100\%} = \frac{5}{100} = .05
\]

\[
\times .29
\]

\[
\times .29
\]

Method 4
\[
\frac{.29}{100} = \frac{.29}{100} = .05
\]

Method 5
\[
\frac{1}{20} \times \frac{.29}{100} = \frac{.29}{100} = \frac{1.45}{100} = .05
\]

All are correct!

I like #4 best. I know when I find 1\% I'm \(\frac{1}{100}\). That means I can move decimal 2 places left. Once I find 1\% I can find any \% by mult. What I got for 1\% by the new \%
# 2

\[ \frac{9.36}{8}\% \quad \text{1.17 is 1}\% \quad \frac{117}{100} = 1\% \]  
117 \div 3 = 39

\[ 8\% \times 12.5 = 100\% \]

9.36 is 8% of 117.

\[ 9.36 \times 12.5 = 117 \]

\[ \text{Question #3} \]

\[ \text{Method #1} \rightarrow \text{let the price of refrigerator be a set amount. I'll will use } \$100 \text{ in this case} \]

\[ S = \text{discount} (0) \]

\[ A = \text{Sales Prices are} = \quad B. \text{Original Prices} = \]

<table>
<thead>
<tr>
<th>Item</th>
<th>REP</th>
<th>STORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price</td>
<td>$60</td>
<td>$60</td>
</tr>
<tr>
<td>S</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>$60</td>
<td>$60</td>
<td>$60</td>
</tr>
<tr>
<td>0.80</td>
<td>0.80</td>
<td></td>
</tr>
</tbody>
</table>

original price store \( \rightarrow \) $75 = x

Spend = 60 + 60 = $120

15 \times 70(100+100) = $140

15 \times 70(100+75) = 120

15 \times 70(175) = 120

135 \times 60 = 120

\[ \text{Not part A} \quad \text{Part B} \]

Spend = 60 + 80 = $140

\[ 70(200) \text{ } 140 = 140 \]
\[ C = \text{Sales Price Ref is Twice Sales Star} \]

\[ D = \text{Drug Price Ref is Twice \ Star} \]

\[ \text{Ref} \quad \text{Star} \quad \text{Ref} \quad \text{Star} \]

\[ S = 1.60(100) \quad S = 30 \ (\frac{1}{2} \text{ of Ref}) \quad 0.70 \quad S = 0.60(100) \quad D = 50 \]

\[ S = 60 \quad 30 = 180(x) \quad S = 60 \quad S = 0.80(50) \]

\[ 180 \quad 180 \]

\[ S = 40 \]

\[ \$37.50 = x \]

\[ \text{Spends} = \$60 + \$40 = \$100 \]

\[ \text{Spends} = \$60 + \$30(60) = \$90(60) \]

\[ 15 \cdot 70(100 \div 50) \stackrel{?}{=} 100 \]

\[ \times 70(150) \stackrel{?}{=} 100 \]

\[ \times 70(137.50) \stackrel{?}{=} 90.00 \]

\[ 105 \neq 100 \]

\[ \text{Yes} \]

\[ 96.35 \neq 90 \]