Study the table below. The table shows the distance Ricky walks each dog after school.

### Distance Walked

<table>
<thead>
<tr>
<th>Name of Dog</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speedy (S)</td>
<td>1 mile</td>
</tr>
<tr>
<td>Wags (W)</td>
<td>1.75 miles</td>
</tr>
<tr>
<td>Cookie (C)</td>
<td>0.25 miles</td>
</tr>
<tr>
<td>Jumper (J)</td>
<td>1½ miles</td>
</tr>
<tr>
<td>Paws (P)</td>
<td>½ mile</td>
</tr>
</tbody>
</table>

On the number line below, Point S represents the distance Ricky walks Speedy. Label the points for the distances that Ricky walks each of the other dogs.
CSAP Mathematics Scoring Guide

Item 1:
Rubric
Exemplary Response

Score Points: Apply 2-point holistic rubric.

This item appeared at only one grade level.

Grade 5
Standard 1.1a: Number Sense
Subcontent Area: number and operations
Study the graph below. The graph shows the profit a clothing shop makes from selling sweaters and pairs of jeans.

**Clothing Shop Profit**

<table>
<thead>
<tr>
<th>Profit</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1,600</td>
</tr>
<tr>
<td>$1,400</td>
</tr>
<tr>
<td>$1,200</td>
</tr>
<tr>
<td>$1,000</td>
</tr>
<tr>
<td>$800</td>
</tr>
<tr>
<td>$600</td>
</tr>
<tr>
<td>$400</td>
</tr>
<tr>
<td>$200</td>
</tr>
<tr>
<td>$0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of Items Sold</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
</tr>
</tbody>
</table>

**Key**

- Sweaters
- Pairs of Jeans

**Part A** Complete the tables below by using the information from the graph to show the amount of profit for the number of items sold.

**Clothing Shop Profits**

<table>
<thead>
<tr>
<th>Number of Sweaters Sold</th>
<th>Amount of Profit (in dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of Pairs of Jeans Sold</th>
<th>Amount of Profit (in dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td></td>
</tr>
</tbody>
</table>
**Part B** What is the amount of profit made from selling one sweater? In the space below, show your work and write your answer on the line.

$ \underline{\hspace{2cm}}$

**Part C** In one day, the shop sold 20 sweaters and 30 pairs of jeans. The sale of which of these items made more profit? In the space below, show your work to find the difference in profit and write your answers on the lines.

$ \underline{\hspace{2cm}}$ made more profit

Difference in profit $ \underline{\hspace{2cm}}$
CSAP Mathematics Scoring Guide

Item 2:
Rubric
Exemplary Response

Part A

Clothing Shop Profits

<table>
<thead>
<tr>
<th>Number of Sweaters Sold</th>
<th>Amount of Profit (in dollars)</th>
<th>Number of Pairs of Jeans Sold</th>
<th>Amount of Profit (in dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>400</td>
<td>10</td>
<td>200</td>
</tr>
<tr>
<td>15</td>
<td>600</td>
<td>15</td>
<td>300</td>
</tr>
<tr>
<td>25</td>
<td>1,000</td>
<td>25</td>
<td>500</td>
</tr>
</tbody>
</table>

Part B

• $40

AND

• By dividing the profit made from selling 10 sweaters, $400, by 10, I can see that the profit made from selling 1 sweater is $40.

OR

• Other valid process
CSAP Mathematics Scoring Guide

Part C

• **Sweaters** made more profit

  Difference in profit $200

AND

• 20 sweaters × $40 per sweater = $800
  30 pairs of jeans × $20 per pair of jeans = $600
  $800 − $600 = $200

OR

• Other valid process

Score Points: Apply 4-point holistic rubric.

This item appeared at two adjacent grade levels.

Grade 5
Standard 3.4b: Data Analysis, Probability, and Statistics
Subcontent Area: data displays

Grade 6
Standard 3.4a: Data Analysis, Probability, and Statistics
Subcontent Area: not classified
On the board in her classroom, Ms. Jones wrote the number sentence shown below.

\[ 6 \times 18 = ? \]

Study what three of her students said.

I don’t know the exact answer, but I know it is more than 60.

The answer is about 120.

I can solve the number sentence using 
\[ (6 \times 10) + (6 \times 8) = 108. \]

Part A  In the space below, explain how Marni could know that the answer is more than 60 without solving the number sentence.
Part B  In the space below, explain how Sally could use estimation to find that the answer is about 120.

Part C  Nick wants to use his strategy to solve the problem shown below.

\[ 7 \times 24 = ? \]

In the space below, show how Nick would solve the problem using his strategy.
CSAP Mathematics Scoring Guide

Item 3:

Rubric

Exemplary Response

Part A

• $6 \times 10$ equals 60. Since 18 is greater than 10, the answer must be greater than 60.

OR

• Other valid response

Part B

• Sally rounded 18 to 20 and then multiplied $6 \times 20$ to get 120.

OR

• Other valid response

Part C

• $(7 \times 20) + (7 \times 4) = 168$

OR

• Other valid response

Score Points: Apply 3-point holistic rubric.

This item appeared at two adjacent grade levels.

Grade 5
Standard 1.6b: Number Sense
Subcontent Area: numbers and operations

Grade 6
Standard 1.6a: Number Sense
Subcontent Area: numbers and operations
Madeline is setting up dominoes in a line, as shown below. Each domino requires \( \frac{7}{8} \) inch of space in the line.

**Part A** The line of dominoes will be 29 feet long. A box of dominoes contains 28 dominoes. **Estimate** the number of boxes Madeline will need. In the space below, show your work and write your estimate on the line.

**Estimate** ____________ boxes
Part B After Madeline pushes over the first domino, each domino in the line will fall one after the other. It takes 0.8 seconds for 5 dominoes to fall. Estimate the time it will take for all the dominoes to fall. In the space below, show your work and write your estimate on the line.

Estimate ___________ seconds

Item 4:
Rubric
Exemplary Response

Part A
• Estimate 12 boxes (accept range 12 to 15 boxes)

AND
• Each domino requires \( \frac{7}{8} \) inch = 1 inch,
  29 feet = 30 feet and 12 inches per foot \( \times \) 30 feet = 360 inches,
  so 360 inches/1 inch per domino = 360 dominoes, and
  28 dominoes per box = 30 dominoes per box, so
  360 dominoes/30 dominoes per box = 12 boxes.

OR
• Each domino requires \( \frac{7}{8} \) inch = 0.875 inch.
  Approximately 360 inches/0.875 inch per domino = 411 dominoes, and
  411 dominoes/28 dominoes per box = 14.7 boxes = 15 boxes.

OR
• Other valid response
CSAP Mathematics Scoring Guide

Part B

• Estimate 72 seconds (accept range 54 to 80)

AND

• 5 dominoes fall in 0.8 seconds = 1 second
  the time it takes 360 dominoes to fall is approximately
  360 dominoes/5 dominoes per second = 72 seconds

OR

• 29 feet \times 12 \text{ inches per foot} = 348 \text{ inches} = 350 \text{ inches/1 inch per domino} = 350 \text{ dominoes and}
  350 \text{ dominoes} \times 0.8 \text{ seconds/5 dominoes} = 0.8 \text{ seconds} \times 70 = 56 \text{ seconds}

OR

• Other valid response

Score Points: Apply 3-point holistic rubric.

This item appeared at only one grade level.

Grade 7
Standard 6.3b: Operation and Calculation
Subcontent Area: number sense
Study the diagram below. The diagram shows a farmer’s field. It takes the farmer approximately 6 minutes to plow a strip that measures 10 feet wide by 600 feet long.

**Part A** What is the area, in square feet, that the farmer plows per minute? In the space below, show your work and write your answer on the line.

________________________ square feet per minute
Part B  At the same rate, approximately how long will it take the farmer to plow the entire field? In the space below, show your work and write your answer on the line.

Approximately ________________ hours

Part C  The next time he plows his field, the farmer uses new equipment. Now, the farmer can plow a strip that measures 600 feet long by 12 feet wide in approximately 6 minutes. Approximately how much time will the farmer save when plowing his entire field with his new equipment? In the space below, show your work and write your answer on the line.

Approximate time saved ________________
CSAP Mathematics Scoring Guide

Item 5:
Rubric
Exemplary Response

Part A

• 1,000 square feet per minute

AND

• One strip is (600 ft)(10 ft) = 6,000 square feet. Since it takes 6 minutes to plow one strip, the area per minute is \( \frac{6,000 \text{ square feet}}{6 \text{ minutes}} = 1,000 \text{ square feet per minute}. \)

OR

• Other valid response

Part B

• Approximately 4 hours (or 240 minutes)

AND

• Area of entire field = (500 ft)(300 ft) + (300 ft)(300 ft) = 150,000 + 90,000 = 240,000 square feet. At the same rate, it will take \( \frac{240,000 \text{ square feet}}{1,000 \text{ square feet/minute}} = 240 \text{ minutes}, \) or \( 240 \div 60 = 4 \text{ hours}. \)

OR

• Other valid response
CSAP Mathematics Scoring Guide

Part C

• Approximate time saved 40 minutes

AND

• With the new equipment, each strip will have an area of \((600 \text{ ft})(12 \text{ ft}) = 7,200 \text{ square feet}\), so the new rate will be \(\frac{7,200 \text{ square feet}}{6 \text{ minutes}} = 1,200 \text{ square feet per minute}\). At that rate, the entire field will take \(\frac{240,000 \text{ square feet}}{1,200 \text{ square feet/minute}} = 200 \text{ minutes}\). So the new equipment will save \(240 - 200 = 40 \text{ minutes}\).

OR

• Other valid response

Score Points: Apply 4-point holistic rubric.

This item appeared at only one grade level.

Grade 8
Standard 6.4a: Patterns, Functions, and Algebra
Subcontent Area: proportional thinking
From your punch-out tools, use the protractor to help you solve this problem.

**Part A** The circle graph below shows the proportions of a publisher’s books sold to schools, bookstores, and libraries. Label the circle graph by writing the percents on the lines.

**Books Sold**

- **Bookstores**
  - _____%

- **Libraries**
  - _____%

- **Schools**
  - _____%

**Part B** The publisher sold 350,000 books last year. How many books were sold to bookstores? In the space below, show your work and write your answer on the line.

_________ books

Publisher—company that prepares books
CSAP Mathematics Scoring Guide

Item 6:
Rubric
Exemplary Response

Part A

- Books Sold
  - Bookstores 20%  
  - Libraries 15%  
  - Schools 65%

- Accept range: Libraries 14% to 15%, Bookstores 20% to 21%, Schools 64% to 65%

Part B

- 70,000 books
  AND
  - 350,000 books(20%) = 350,000(0.20) = 70,000 books
  OR
  - Other valid response

Score Points: Apply 2-point holistic rubric.

This item appeared at only one grade level.

Grade 8
Standard 3.1a: Data Analysis, Probability, and Statistics
Subcontent Area: proportional thinking
Russell hits a golf ball, the path of which can be approximated by the equation shown below.

\[ y = \frac{-1}{400} (x - 140)^2 + 49 \]

\( y \) = height of the ball, in yards  
\( x \) = horizontal distance, in yards

**Part A**  Find the height of the ball after it has traveled a horizontal distance of 100 yards. In the space below, show your work and write your answer on the line.

<table>
<thead>
<tr>
<th>Height</th>
<th>yards</th>
</tr>
</thead>
</table>

**Part B**  What do the \( x \)-intercepts represent in the context of the problem? On the lines below, explain your reasoning.
Part C  Study the diagram below. The diagram shows a tree at a horizontal distance of 160 yards from the starting point of the ball. The tree is 139 feet tall.

By how many feet will the ball clear the tree? In the space below, show your work and write your answer on the line.

feet
CSAP Mathematics Scoring Guide

Item 7:
Rubric
Exemplary Response

Part A

• Height 45 yards

AND

• \[ h = -\frac{1}{400} (100 - 140)^2 + 49 \]

\[ h = -\frac{1}{400} (-40)^2 + 49 \]

\[ h = -\frac{1}{400} (1,600) + 49 \]

\[ h = -4 + 49 \]

\[ h = 45 \]

OR

• Other valid process

Part B

• The x-intercepts represent the points at which the ball is at a height of zero yards, which are at the beginning of the hit and after the ball lands.

OR

• Other valid process
CSAP Mathematics Scoring Guide

Part C

- 5 feet

AND

- \[ h = -\frac{1}{400} (160 - 140)^2 + 49 \]
  
  \[ h = -\frac{1}{400} (400) + 49 \]
  
  \[ h = -1 + 49 \]

48 yards × 3 feet per yard = 144 feet

OR

- Other valid process

Score Points: Apply 3-point holistic rubric.

This item appeared at two adjacent grade levels.

Grade 9
Standard 2.3a: Patterns, Functions, and Algebra
Subcontent Area: not classified

Grade 10
Standard 2.3a: Patterns, Functions, and Algebra
Subcontent Area: not classified
The snow sports club in Montrose surveyed its members. The results of the survey are shown below.

- 35% of the members downhill ski only.
- 20% of the members cross-country ski only.
- 45% of the members snowboard only.

What is the fewest number of people that could be members of the club? In the space below, show your work and write your answer on the line.

________________________ people
CSAP Mathematics Scoring Guide

Item 8:

Rubric

Exemplary Response

• 20 people

AND

• If 100 people were in the club, the ratio of each type would be 35:20:45. These numbers are all divisible by 5, giving 7:4:9, which is fully reduced. Summing gives 20 members.

OR

• Other valid response

Score Points: Apply 2-point holistic rubric.

This item appeared at two adjacent grade levels.

Grade 9
Standard 6.1a: Operation and Calculation
Subcontent Area: not classified

Grade 10
Standard 6.1a: Operation and Calculation
Subcontent Area: not classified
Karen will enlarge the photograph shown below.

Part A  While maintaining the ratio of height to width, Karen will increase the height to 12.5 inches. What will be the width of the enlarged photograph? In the space below, show your work and write your answer on the line.

____________________ inches
Part B  Karen will use a copy machine to enlarge the photograph. The copy machine increases the area of the photograph by any percentage, while maintaining the height-to-width ratio of the original. By what percent does Karen need to enlarge the area of the original photograph? In the space below, show your work and write your answer on the line.

____________________ percent

Part C  Before framing, Karen surrounded the enlarged photograph with a 2-inch border. On the lines below, explain the effect of the border on the proportional relationship between the height and width.
CSAP Mathematics Scoring Guide

Item 9:
Rubric
Exemplary Response

Part A
• 7.5 inches
AND
• $12.5 \times 3 \div 5 = 7.5$ inches
    OR
• Other valid process

Part B
• 625 percent
AND
• $(12.5 \times 7.5) \div (5 \times 3) \times 100 = 625\%$
    OR
• Other valid process

Part C
• The framed photograph does not have the same ratio because the ratios of the original and enlarged photographs are 5 to 3, while the ratio of the framed photograph is $16 \frac{1}{2}$ to $11 \frac{1}{2}$.
    This is not an equivalent ratio because it does not reduce to $\frac{5}{3}$.
    OR
• Other valid response comparing $5 : 3$ to $16.5 : 11.5$

NOTE: A student may draw diagrams in the space available at the bottom of the page. Diagrams may be referred to in the student’s explanation.

Score Points: Apply 3-point holistic rubric.

This item appeared at only one grade level.

Grade 10
Standard 6.1a: Operation and Calculation
Subcontent Area: not classified

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