New York State Testing Program
Mathematics Test

2013 Turnkey Training

Grade 6 Extended-response (3-point) Sample Question

Guide Set

2 A closed box in the shape of a rectangular prism has a length of 13 cm, a width of 5.3 cm, and a height of 7.1 cm.

Draw a net of the box and find its surface area in square centimeters.

Show your work.

Answer _____

Common Core Learning Standard Assessed: 6.G.4

Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.

2 A closed box in the shape of a rectangular prism has a length of 13 cm, a width of 5.3 cm, and a height of 7.1 cm.

Draw a net of the box and find its surface area in square centimeters.

Show your work.

7.1 cm

13 cm
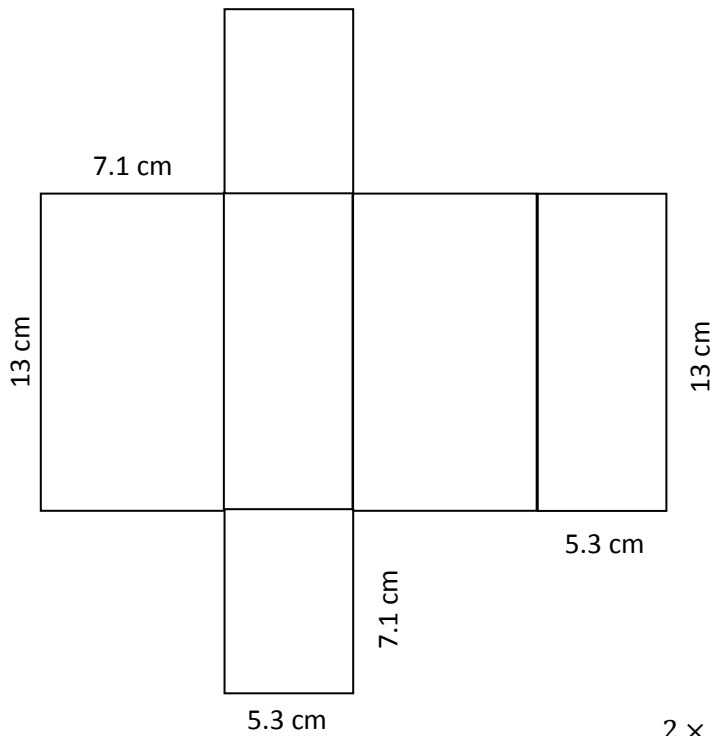
13 cm

5.3 cm

7.1 cm

5.3 cm

$2 \times (13 \times 7.1) = 2 \times 92.3 = 184.6$

$2 \times (5.3 \times 7.1) = 2 \times 37.63 = 75.26$

$2 \times (5.3 \times 13) = 137.8$

$184.6 + 75.26 + 137.8 = 397.66$

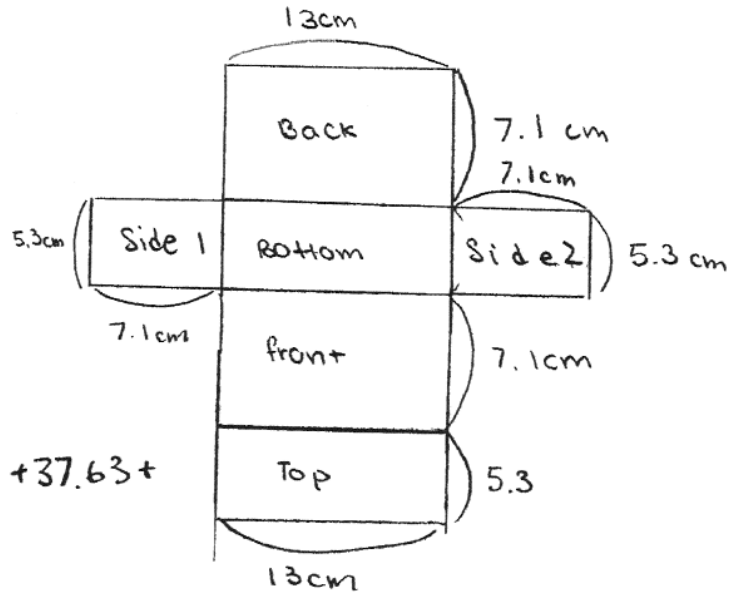**Answer** ___397.66 sq. cm.___

2 A closed box in the shape of a rectangular prism has a length of 13 cm, a width of 5.3 cm, and a height of 7.1 cm.

Draw a net of the box and find its surface area in square centimeters.

Show your work.

Back = 13×7.1 = 92.3
Front = 13×7.1 = 92.3
Bottom = 13×5.3 = 68.9
Top = 13×5.3 = 68.9
Side 1 = 7.1×5.3 = 37.63
Side 2 = 7.1×5.3 = 37.63

92.3 + 92.3 + 68.9 + 68.9 + 37.63 + 37.63 =

[Net diagram with labels: 13cm, Back, 7.1 cm, 7.1cm, 5.3cm, Side 1, Bottom, Side 2, 5.3 cm, 7.1cm, front, 7.1cm, Top, 5.3, 13cm]

Answer: __397.66__

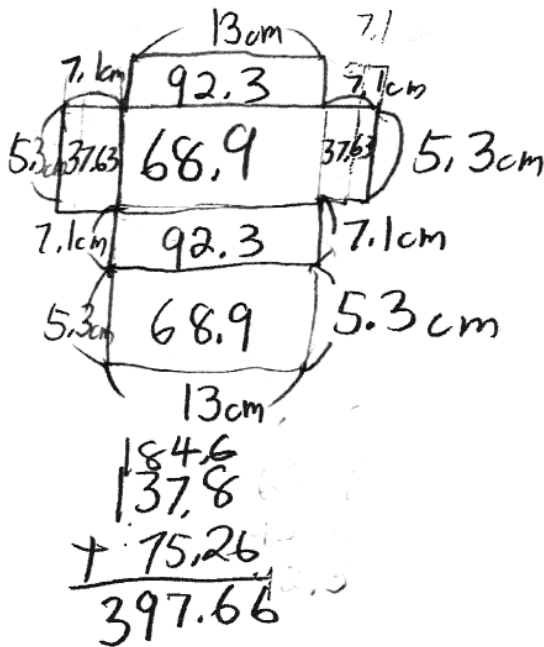| Paper	RF Number	Score	Notes
g01	N/A	3	**Score Point 3** This response answers the question correctly and demonstrates a thorough understanding of the mathematical concepts. A complete net is drawn and accurately labeled, and all calculations for each of the rectangles are shown. The final answer, the sum of the area of all six rectangles, is correct.

2 A closed box in the shape of a rectangular prism has a length of 13 cm, a width of 5.3 cm, and a height of 7.1 cm.

Draw a net of the box and find its surface area in square centimeters.

Show your work.

$$13 \times 7.1$$

$$\begin{array}{r} 13 \\ \times 7.1 \\ \hline 13 \\ 91 \\ \hline 92.3 \end{array}$$

$$\begin{array}{r} 13 \\ \times 5.3 \\ \hline 39 \\ 65 \\ \hline 68.9 \end{array}$$

13cm 7.1

7.1cm 92.3 7.1cm

5.3 37.63 68.9 37.63 5.3cm

7.1cm 92.3 7.1cm

5.3 68.9 5.3 cm

13cm

$$\begin{array}{r} 184.6 \\ 137.8 \\ + \ 75.26 \\ \hline 397.66 \end{array}$$

$$\begin{array}{r} 7.1 \\ \times 5.3 \\ \hline 213 \\ 355 \\ \hline 37.63 \end{array}$$

$$\begin{array}{r} 68.9 \\ \times \ 2 \\ \hline 137.8 \end{array}$$

$$\begin{array}{r} 92.3 \\ \times \ 2 \\ \hline 184.6 \end{array}$$

$$\begin{array}{r} 37.63 \\ \times \ 2 \\ \hline 75.26 \end{array}$$

Answer: 397.66 cm²

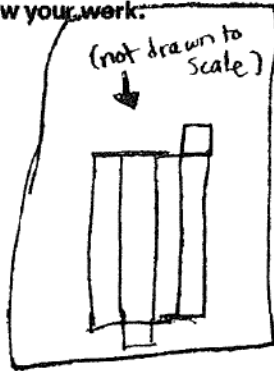| Paper	RF Number	Score	Notes
g02	N/A	3	**Score Point 3** This response answers the question correctly and indicates that the student has completed the task correctly, using mathematically sound procedures. A complete net is drawn and accurately labeled. The calculations for each of the three sizes of rectangles are shown, multiplied by two, and then added. The final answer is correct.

2 A closed box in the shape of a rectangular prism has a length of 13 cm, a width of 5.3 cm, and a height of 7.1 cm.

Draw a net of the box and find its surface area in square centimeters.

Show your work:

(not drawn to scale)

Surface area = 397.66 cm³

$$7.1 \times 5.3 = 37.63 \times 2 = 75.26$$
$$13 \times 5.3 = 68.9 \times 2 = 137.8$$
$$7.1 \times 13 = 92.3 \times 2 = 184.6$$

$$75.26 + 137.8 + 184.6 = 397.66$$

Answer: __397.66 cm²__

Paper	RF Number	Score	Notes
g03	N/A	3	**Score Point 3** This response answers the question correctly and demonstrates a thorough understanding of the mathematical concepts. A complete net is drawn. The calculations for each of the three sizes of rectangles are shown, multiplied by two, and then added. The final answer is correct. Labeling the dimensions of the net is not required for demonstration of a thorough understanding of the problem. The run-on equations and the cm^3 label do not detract from the demonstration of a thorough understanding of the mathematical concepts.

2 A closed box in the shape of a rectangular prism has a length of 13 cm, a width of 5.3 cm, and a height of 7.1 cm.

Draw a net of the box and find its surface area in square centimeters.

Show your work.

(not to scale)

13 x 2 x 5.3 = 157.8
13 x 2 x 7.1 = 184.6 —
7.1 x 2 x 5.3 = 75.26
                    11
387.66 cm²

5.3 cm

7.1 cm

5.3 cm

7.1 cm

13 cm   5.3 cm

Answer: 387.66 cm²

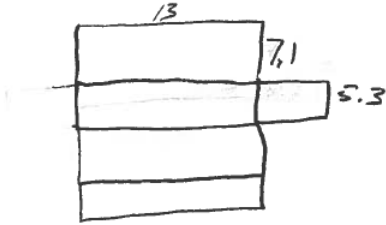| Paper	RF Number	Score	Notes
g04	N/A	2	**Score Point 2** This response is partially correct and addresses most aspects of the task, using mathematically sound procedures. A complete net is drawn and accurately labeled, and the correct procedure for the area calculations for each rectangle is used. However, a multiplication error is made while calculating one of the areas ($13 \times 2 \times 5.3 = 157.8$) and an addition error is made when determining the total area ($157.8 + 184.6 + 75.26 = 387.66$). The lines that appear to be extra flaps on the net are indicators of the lengths of the sides.

2 A closed box in the shape of a rectangular prism has a length of 13 cm, a width of 5.3 cm, and a height of 7.1 cm.

Draw a net of the box and find its surface area in square centimeters.

Show your work.

$$2 \times (13 \times 7.1) + 2 \times (7.1 \times 5.3) + (5.3 \times 13)$$

$$2 \times 92.3 + 2 \times 37.63 + 68.9$$

$$184.6 + 75.26 + 68.9$$

184.6
75.26
68.9
_____
328.76

Answer: ___328.76___

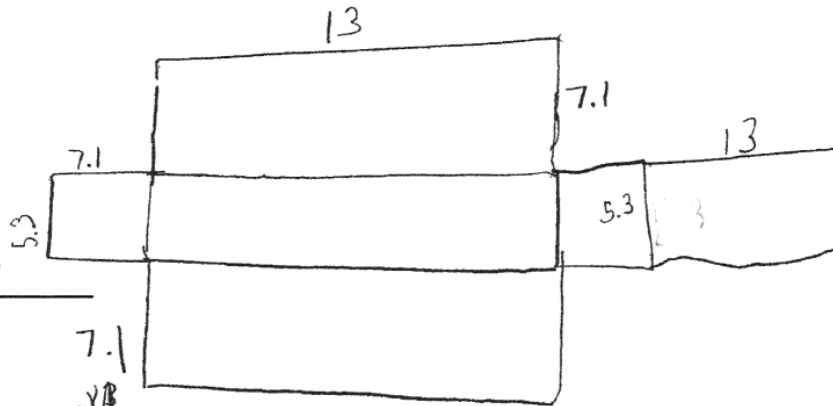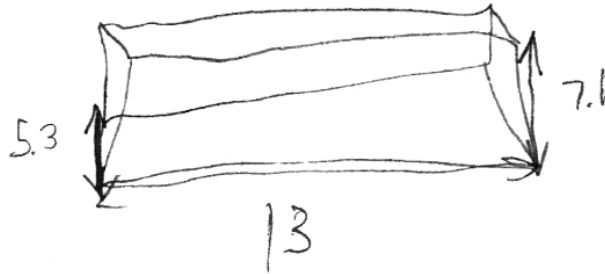| Paper	RF Number	Score	Notes
g05	N/A	2	**Score Point 2** This response demonstrates partial understanding of the mathematical procedures embodied in the task. The net, missing the rectangle that represents one side (5.3 by 7.1) of the box, is only partially correct. The surface area calculated is for an open, rather than a closed, box; the area representing the top of the box is not included.

2 A closed box in the shape of a rectangular prism has a length of 13 cm, a width of 5.3 cm, and a height of 7.1 cm.

Draw a net of the box and find its surface area in square centimeters.

Show your work.

Answer: ___105.50___

$$3763$$
$$\underline{\times \quad 2}$$
$$75.26 \quad 12$$
$$84.6 \quad 8$$
$$17.8$$
$$\overline{650}$$

$$7.1$$
$$\underline{\times 13}$$
$$213$$
$$\underline{+710}$$
$$92\frac{3}{2}$$
$$\underline{\times}$$
$$184.6$$

$$7.1$$
$$\times 6.5 \quad \frac{5.3}{13}$$
$$\overline{159}$$
$$\underline{+530}$$
$$589$$

13

$$2(5.3 \times 7.1) + 2(13 \times 7.1) + 2(13 \times 5.3) =$$

$$7.1$$
$$\underline{\times \quad 5.3}$$
$$213$$
$$\underline{+3550}$$
$$3763$$

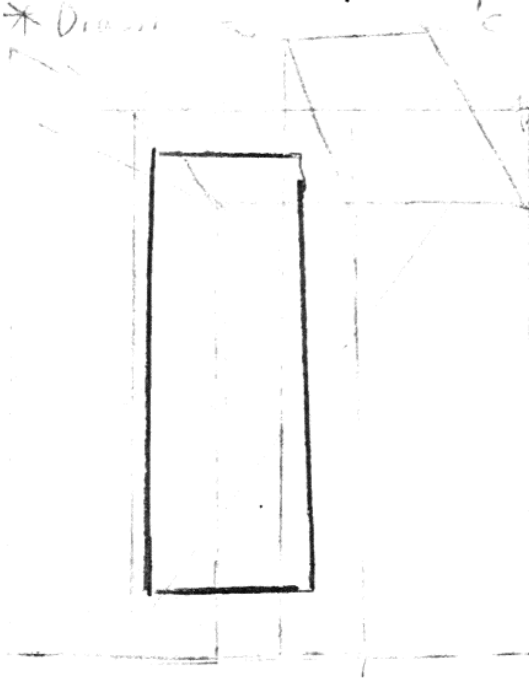| Paper	RF Number	Score	Notes
g06	N/A	2	**Score Point 2** This response is partially correct and addresses most aspects of the task, using mathematically sound procedures. A complete net is drawn and accurately labeled, and the correct procedure for the total area calculation is shown in the work. However, minor calculation errors result in an incorrect answer.

2

A closed box in the shape of a rectangular prism has a length of 13 cm, a width of 5.3 cm, and a height of 7.1 cm.

Draw a net of the box and find its surface area in square centimeters.

Show your work.

*Not drawn to scale

Answer: _____198.83 units²_____

$13 \times 5.3 = 68.9$
$7.1 \times 5.3 = 37.63$
$7.1 \times 13 = 92.3$

```
   0 ①①
   68.90
   37.63
  +92.30
  198.83
```

Guide Paper 7

Page 16
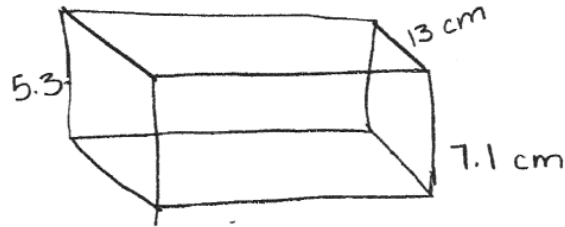
Paper	RF Number	Score	Notes
g07	N/A	1	**Score Point 1** This response is incomplete and exhibits many flaws but is not completely incorrect; it addresses some elements of the task correctly but reaches an inadequate solution and provides reasoning that is incomplete. No net is shown. The area calculations for each size rectangle are shown and are correctly added together. However, the determined value is not multiplied by 2 to determine the total surface area.

2 A closed box in the shape of a rectangular prism has a length of 13 cm, a width of 5.3 cm, and a height of 7.1 cm.

Draw a net of the box(and find its surface area in square centimeters.

Show your work.

$$
\begin{array}{r}
1\,1\,2 \\
1378 \\
7526 \\
+\ 1846 \\
\hline
10,75\,0
\end{array}
$$

$$
\underset{689}{2(13\cdot 5.3)} + \underset{3763}{2(7.1\cdot 5\cdot 3)} + \underset{923}{2(13\cdot 7.1)}
$$

$$
1378 + 7526 + 1846
$$

Answer: _10,750 cm.²_

$$
\begin{array}{r}
13 \\
\times\,7.1 \\
\hline
13 \\
91\,0 \\
\hline
923 \\
2 \\
\hline
1846
\end{array}
$$

$$
\begin{array}{r}
5.3 \\
\times\,13 \\
\hline
159 \\
+\ 530 \\
\hline
689
\end{array}
\qquad
\begin{array}{r}
689 \\
2 \\
\hline
1378
\end{array}
\qquad
\begin{array}{r}
7.1 \\
\times\,5.3 \\
\hline
213 \\
+\ 3550 \\
\hline
3763 \\
\times\ 2 \\
\hline
7526
\end{array}
$$

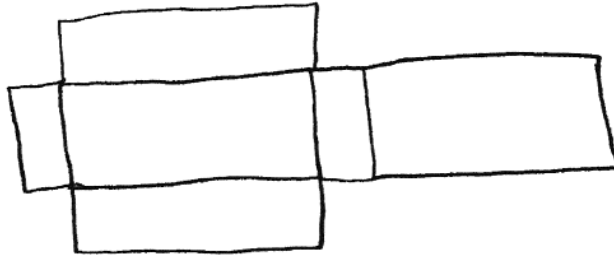| Paper	RF Number	Score	Notes
g08	N/A	1	**Score Point 1** This response exhibits many flaws but is not completely incorrect and demonstrates only a limited understanding of the mathematical procedures embodied in the task. No net is shown. While the work shows the correct procedures for the calculation of the total surface area, multiplication errors for all three sizes of rectangles result in an incorrect answer.

2

A closed box in the shape of a rectangular prism has a length of 13 cm, a width of 5.3 cm, and a height of 7.1 cm.

Draw a net of the box and find its surface area in square centimeters.

Show your work.

$$
\begin{array}{r}
5.3 \\
\times \ 13 \\
\hline
159 \\
+ 530 \\
\hline
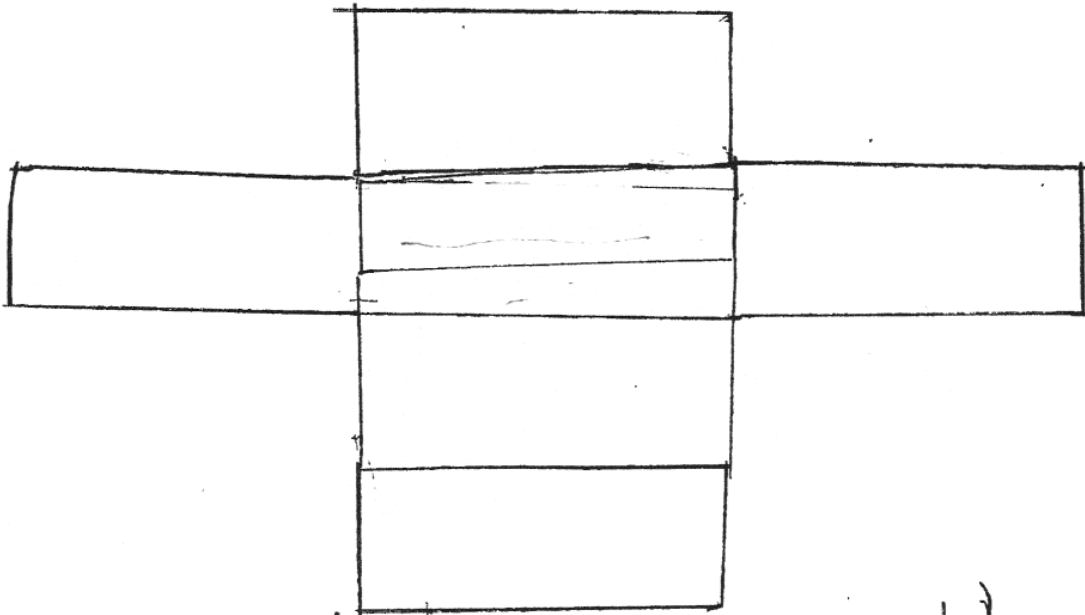68.9 \\
+ \ 7.1 \\
\hline
74.9
\end{array}
$$

Answer: ___74.9² cm___

Paper	RF Number	Score	Notes
g09	N/A	1	**Score Point 1** This response exhibits many flaws but is not completely incorrect and reflects a lack of essential understanding of the underlying mathematical concepts. An appropriate net is shown. However, an inappropriate mathematical process is used to determine the surface area and the answer is incorrect.

2 A closed box in the shape of a rectangular prism has a length of 13 cm, a width of 5.3 cm, and a height of 7.1 cm.

Draw a net of the box and find its surface area in square centimeters.

Show your work.

(Not Drawn to scale)

Answer: ___134.2 cm²___

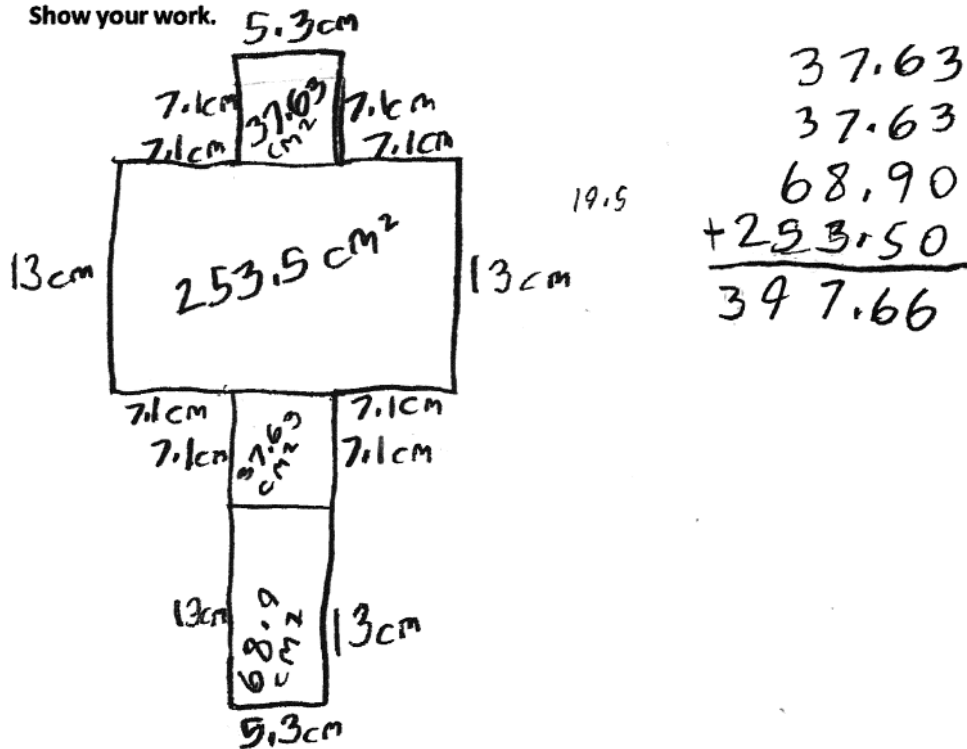| Paper	RF Number	Score	Notes
g10	N/A	0	**Score Point 0** This response is incorrect. A net is shown; however, the size of all 6 rectangles is approximately the same. This net is not an appropriate representation of the original three-dimensional figure. No other work is shown and the answer given is incorrect.

2

A closed box in the shape of a rectangular prism has a length of 13 cm, a width of 5.3 cm, and a height of 7.1 cm.

Draw a net of the box and find its surface area in square centimeters.

Show your work.

$$13 \times 7.1 \times 5.3 = 489.19$$

Answer: 489.19

Paper	RF Number	Score	Notes
g11	N/A	0	**Score Point 0** This response is irrelevant. No net is shown and the volume is calculated, rather than the surface area.

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Mathematics Test

2013 Turnkey Training

Grade 6 Extended-response (3-point) Sample Question

Practice Set

2 A closed box in the shape of a rectangular prism has a **length** of 13 cm, a **width** of 5.3 cm, and a **height** of 7.1 cm.

Draw a net of the box and find its surface area in square centimeters.

Show your work.

5.3cm

7.1cm 37.63 cm² 7.1cm
7.1cm   7.1cm

13cm   253.5 cm²   13cm

19.5

7.1cm   7.1cm
7.1cm   7.1cm

13cm   13cm

5.3cm

37.63
37.63
68.90
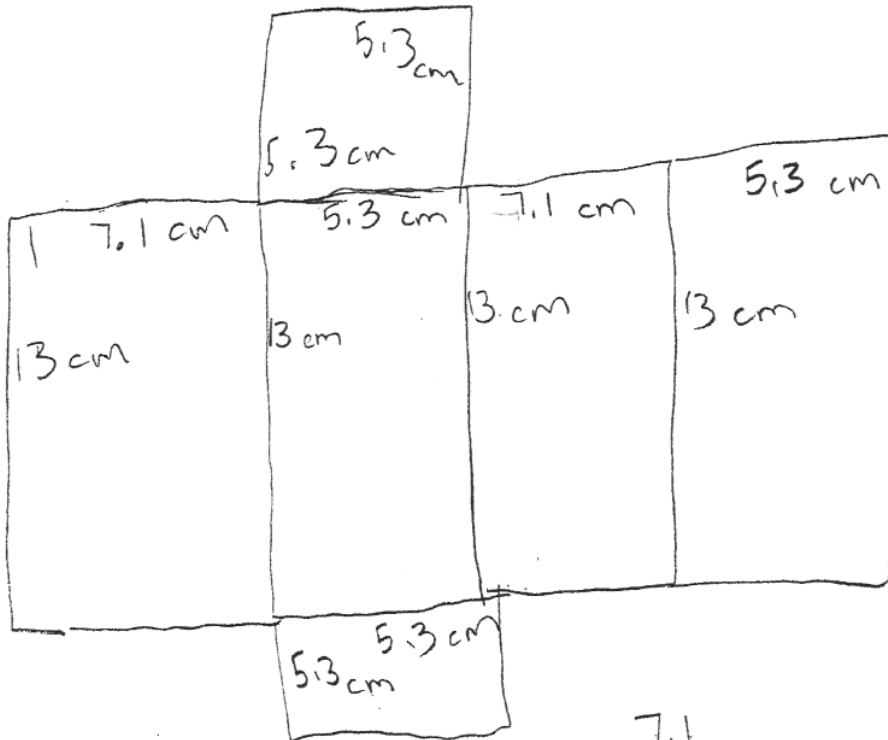+253.50
─────
397.66

Answer: 397.66 cm²

Practice Set 1

Page 1
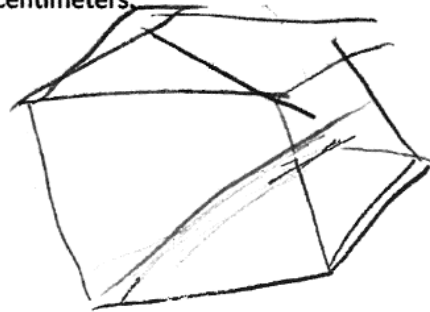
2 A closed box in the shape of a rectangular prism has a length of 13 cm, a width of 5.3 cm, and a height of 7.1 cm.

Draw a net of the box and find its surface area in square centimeters.

Show your work.

5.3 cm

5.3 cm

7.1 cm   5.3 cm   7.1 cm   5,3 cm

13 cm   13 cm   13.cm   13 cm

5.3 cm   5.3 cm

Answer: ___923___ cm^2

$$\begin{array}{r} 7.1 \\ \times 13 \\ \hline 213 \\ + 71 \\ \hline 923 \end{array}$$

2 A closed box in the shape of a rectangular prism has a length of 13 cm, a width of 5.3 cm, and a height of 7.1 cm.

Draw a net of the box and find its surface area in square centimeters.

Show your work.

SA= ⊃A

$13 \times 5.3 = 68.9$

$68.9 \times 7.1 = 489.19$ CM

12.2475

$4 \overline{)489.1900}$

R. ?

Answer: $12,2475$ cm

$\begin{array}{r} -4 \\ \hline 08 \\ -8 \\ \hline 09 \\ -8 \\ \hline 19 \\ -16 \\ \hline 30 \\ -28 \\ \hline 20 \\ -20 \end{array}$
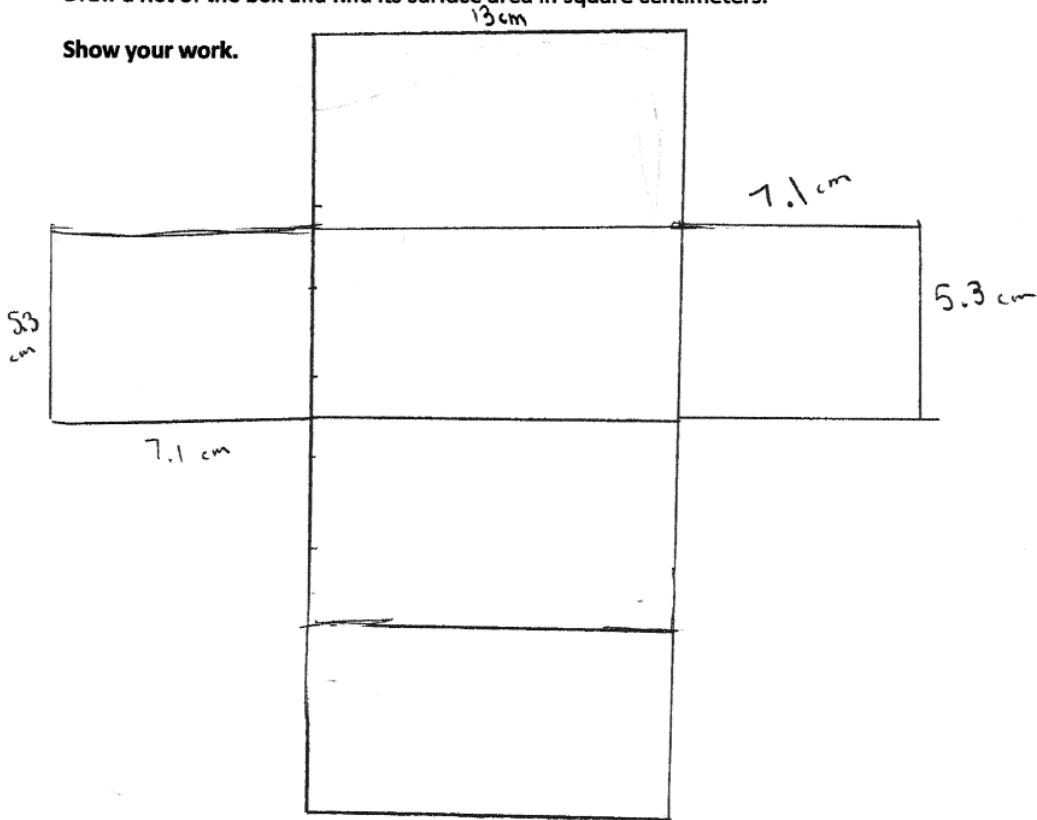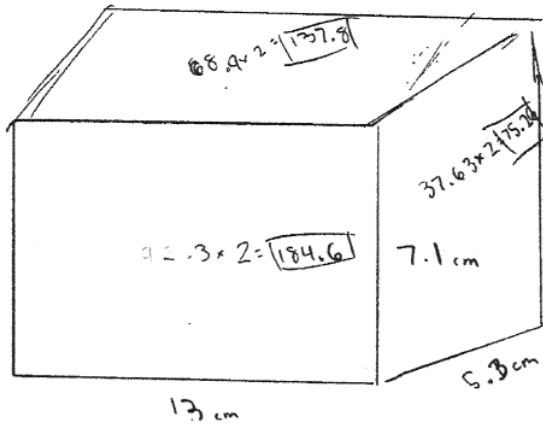
2 A closed box in the shape of a rectangular prism has a length of 13 cm, a width of 5.3 cm, and a height of 7.1 cm.

Draw a net of the box and find its surface area in square centimeters.

Show your work.

13 cm

7.1 cm

5.3 cm

83 cm

7.1 cm

.. 13 cm

Answer: _____ 397.66 un²

68.9 × 2 = [137.8]

37.63 × 2 [75.26]

13 .3 × 2 = [184.6]

7.1 cm

13 cm

5.3 cm

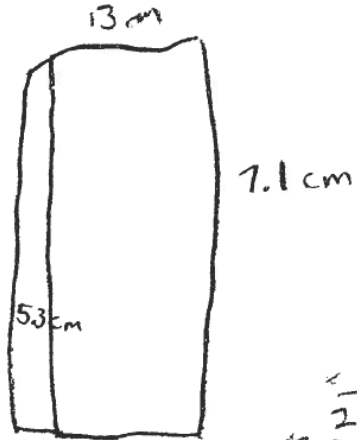137.8 + 75.26 + 184.6 = 397.66

Practice Set 4

2 A closed box in the shape of a rectangular prism has a length of 13 cm, a width of 5.3 cm, and a height of 7.1 cm.

Draw a net of the box and find its surface area in square centimeters.

Show your work.

$$
\begin{array}{r}
5.3 \\
\times 13 \\
\hline
159 \\
+\ 530 \\
\hline
68.9
\end{array}
$$

$$
\begin{array}{r}
13 \\
\times 7.1 \\
\hline
13 \\
+91 0 \\
\hline
92.3
\end{array}
$$

13 cm

7.1 cm

5.3 cm

$$
\begin{array}{r}
7.1 \\
\times 5.3 \\
\hline
213 \\
+3 5 5 0 \\
\hline
37.63
\end{array}
$$

$$
\begin{array}{r}
37.63 \\
37.63 \\
68.9 \\
68 9 \\
92.3 \\
+92.3 \\
\hline
396.6
\end{array}
$$

Answer: __396.6 square cm.__

Practice Set 5