Think Smart for the Smarter Balanced Assessment

- Smarter Balanced Assessment Item Types
- Countdown to SBAC
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- Chapter Performance Tasks, Rubrics, and Student Work Samples
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Chapter 2 Performance Task

A Plan to Plant a School Garden
Ms. Denton is working with students to plan a school garden. The school principal tells her that she can use 144 square yards of a school field for the garden.

Write your answers on another piece of paper. Show all your work to receive full credit.

Part A
To save money on fencing, Ms. Denton decides to select a patch of land for the garden that has the shortest perimeter. Should she choose a square patch of land or a rectangular patch that is not a square? Explain your reasoning.

Part B
For the vegetables, Ms. Denton wants two rectangular planter beds that are each 6 feet longer than they are wide. Corinna draws up plans and represents the width of each planter bed as \( w \) feet. She identifies the perimeter of each planter bed as \((4w + 6)\) feet. Is Corinna's expression accurate? Explain.

Part C
Jayson wants to know the exact width, \( w \), and length of these vegetable planter beds so he can start sawing wood to make the structures. Tyler tells Jayson that the perimeter of each bed is \((3w + 14)\) feet. Lourdes says that the perimeter of each bed is \((4w + 12)\) feet. Both students are correct. Find the width and length, in feet, of each planter bed.
Ms. Denton hopes the school will make its own compost in the future. Currently she must buy compost for the garden and have it delivered. Company A sells compost for $12.50 per bag plus a $50 delivery fee. Company B sells compost for $11 per bag plus a $95 delivery fee.

**Part D**

How many bags of compost must Ms. Denton buy and have delivered to pay the same total amount to each company? What is the cost for that number of bags? Write an equation and let \( b \) represent the number of bags.

**Part E**

Jayson also builds triangular flower beds for the 4 corners of the garden. Each flower bed needs 52 feet of fencing to surround it. Ms. Denton wants to put compost in each flower bed. What is the total area of the corner flower beds?

**Part F**

Kanti knows that it costs $304 to cover the 4 corner flower beds with compost from Company B. How many bags of compost would each flower bed need? Would it be more or less expensive to buy the compost for all the flower beds from Company A? Justify your answer.
Task Scenario
Students will write and solve linear equations with rational coefficients in one variable; determine whether equations have one, no, or infinitely many solutions; find perimeters and areas; and evaluate conjectures to set plans for a garden.

<table>
<thead>
<tr>
<th>CCSS Content Standard(s)</th>
<th>8.EE.7, 8.EE.7a, 8.EE.7b</th>
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<th>Mathematical Practices</th>
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<th>Depth of Knowledge</th>
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<tr>
<th>Part</th>
<th>Maximum Points</th>
<th>Scoring Rubric</th>
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| A    | 2              | Full Credit:  
Square patch of land:  
$A = s^2 = 144$; $s = \sqrt{144} = 12$  
Each side is 12 yd. The perimeter is $4(12) = 48$ yd.  
Rectangular patch of land:  
Some factors of 144 to test: 2 and 72, 6 and 24, 9 and 16  
Sides are 2 yd and 72 yd. The perimeter is $2(2) + 2(72) = 148$ yd.  
Sides are 6 yd and 24 yd. The perimeter is $2(6) + 2(24) = 60$ yd.  
Sides are 9 yd and 16 yd. The perimeter is $2(9) + 2(16) = 50$ yd.  
Ms. Denton should choose a square patch of land.  
Partial Credit (1 point) will be given for correctly calculating possible perimeters OR a correct explanation.  
No credit will be given for an incorrect answer. |
| B    | 1              | Full Credit:  
width = $w$, length = $w + 6$; So, $P = 2(w + w + 6)$.  
Sample answer: Set Corinna’s expression equal to the perimeter.  
$2(w + w + 6) = 4w + 6$  
$2(2w + 6) = 4w + 6$  
$4w + 12 = 4w + 6$  
$12 \neq 6$  
Because the resulting equation has no real solutions, $4w + 6$ cannot represent the perimeter of the planter bed.  
No credit will be given for an incorrect answer. |
| C    | 2              | Full Credit:  
$3w + 14 = 4w + 12$  
$14 = w + 12$  
$2 = w$  
The width is 2 ft.  
The length is $(w + 6)$ ft from Part B. So the length is $2 + 6$, or 8 ft.  
Partial Credit (1 point) will be given for finding the correct width OR the correct length.  
No credit will be given for an incorrect answer. |
### Chapter 2 Performance Task Rubric, continued

<table>
<thead>
<tr>
<th>Part</th>
<th>Maximum Points</th>
<th>Scoring Rubric</th>
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</table>
| **D** | 2              | **Full Credit:** Company A: $12.5b + 50$; Company B: $11b + 95$  
  
  $12.5b + 50 = 11b + 95$  
  
  $1.5b + 50 = 95$  
  
  $1.5b = 45$  
  
  $b = 30$  
  
  Cost of 30 bags: A: $12.5(30) + 50 = 425$; B: $11(30) + 95 = 425$  
  
  Both companies charge $425 for 30 bags of compost.  
  
  Partial Credit (1 point) will be given for correct number of bags OR the total cost.  
  
  No credit will be given for an incorrect answer. |
| **E** | 2              | **Full Credit:**  
  
  The fencing is the perimeter.  
  
  $2(2x + 1) + 3x + 1 = 52$  
  
  $4x + 2 + 3x + 1 = 52$  
  
  $7x + 3 = 52$  
  
  $7x = 49$  
  
  $x = 7$  
  
  Leg length: $2(7) + 1 = 15$ feet  
  
  Area of 1 flower bed: $A = \frac{1}{2}bh = \frac{1}{2}(15)(15) = 112.5$ ft$^2$  
  
  Area of 4 corner flower beds: $112.5(4) = 450$ ft$^2$  
  
  Partial Credit (1 point) will be given for the correct leg length OR correct area of 4 flower beds.  
  
  No credit will be given for an incorrect answer. |
| **F** | 2              | **Full Credit:**  
  
  Company B: $11b + 95$, where $b$ represents number of bags  
  
  $11b + 95 = 304$  
  
  $11b = 209$  
  
  $b = 19$  
  
  19 bags are needed to cover the flower beds.  
  
  $19 ÷ 4 = 4.75$; Each flower bed needs 4.75 bags.  
  
  Cost from Company A for 19 bags:  
  
  $12.5b + 50 = 12.5(19) + 50 = 237.5 + 50 = 287.5$  
  
  It costs $287.50 from Company A for 19 bags.  
  
  $287.50 < $304, so, Company A is less expensive.  
  
  Partial Credit (1 point) will be given for the correct number of bags for each flower bed OR the final answer and explanation.  
  
  No credit will be given for an incorrect answer. |
| TOTAL | 11             | }
Chapter 2 Performance Task

Part A
Area is 144 square yards.

Square land:
A = 6² = 36; b = 6
Side is 12 yd.
Perimeter is 48 yd.

Rectangular land:
Fencing of 144:
2 and 12: Perimeter is 2(6) + 2(6) = 24 yd.
1 and 44: Perimeter is 2(1) + 2(44) = 90 yd.
9 and 16: Perimeter is 2(9) + 2(16) = 50 yd.

A square patch of land has smaller perimeter.

Part B
width = w, length = w + 10; so, P = 2(w + w + 10).

perimeter = Corinna's expression

\[ P = 12w + 20 \]

Expressions are not equal.

Part C
Perimeters are equal.

\[ 3w + 14 = 4w + 12 \]

\[ 1w = 2 \]

\[ w = 2 \]

The width is 2 ft.
The length is (w + 10) ft from Part B.
The length is 2 ft, or 8 ft.

Part D
Company A: 12.5b + 50; Company B: 11b + 95

\[ 12.5b + 50 = 11b + 95 \]

\[ 1.5b + 50 = 95 \]

\[ 1.5b = 45 \]

\[ b = 30 \text{ bags} \]

Both companies charge $45 for 30 bags of compost.

Part E
The fencing is the perimeter.

\[ 2(2x + 1) + 2x + 1 = 52 \]

\[ 4x + 2 + 2x + 1 = 52 \]

\[ 7x + 3 = 52 \]

\[ 7x = 49 \]

\[ x = 7 \]

Length: 2(7) + 1 = 15 feet

Part F
Company B: 11b + 95

\[ 11b + 95 = 204 \]

\[ 9b = 109 \]

\[ b = 19 \]

19 bags are needed to cover the 4 flowerbeds

\[ 19 ÷ 1 = 4.75 \]

Each flowerbed needs 4.75 bags.

Cost from Company A for 19 bags:

\[ 12.5b + 50 = 12.5(19) + 50 = 257.5 + 50 = 307.5 \]

Company A costs $307.5.

Cost from Company B for 19 bags:

\[ 11b + 95 = 11(19) + 95 = 209 + 95 = 304 \]

Company B is less expensive.
Chapter 2 Performance Task Student Work Sample

Part D

\[
\text{Number of bags} = 12b + 95
\]

\[
11b + 95 = -10.5b + 50
\]

\[
12.5b = 50 - 95
\]

\[
b = -3.6
\]

30 bags

Part E

Perimeter = 52

\[
2(2x + 1) + (3x + 1) = 52
\]

\[
7x + 3 = 52
\]

\[
x = 7
\]

Part F

\[
\frac{11b + 45}{11} = \frac{309}{11}
\]

\[
b = 19 \text{ bags}
\]

Chapter 2 Performance Task

Part A

Area = 144 square ft

Area = \(w^2\)

Part B

Perimeter = \(w + (w + 12) + (w + 6)\)

Part C

Perimeter = \(3w + 14 = 4w + 12\)

\[
w = 2
\]

Width is 2 ft.

3(2) + 14 = 6 + 14 = 20 + 14 = 34

-1w + 14 = \(-\frac{13}{2}\)

-1w = \(-\frac{13}{2}\)

-1w = 2
Chapter 2 Performance Task Student Work Sample

PART A
Area = 144

PART B
Rectangle
width: W
length: W + 10
perimeter: 2(W) + 2(W - 10) = 4W + 20

PART C
\[
\frac{4W + 12}{-3W + 14} = \frac{W - 2}{W + 2} + \frac{2}{2}
\]